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THE JOURNAL OF NEUROLOGY AND PSYCHOPATHOLOGY

Vol. XII. APRIL. 1932. No. 48.

Original Papers.

FAMILIAL BILATERAL ACOUSTIC TUMOURS.*

By

LOUIS MINSKI, London.

With Histopathological Examination by C. GEARY.

INTRODUCTION.

The earliest record of bilateral recess tumours in association with central neurofibromatosis was reported by Wishart[1] in 1882; he regarded them as originating from the seventh cranial nerves. Knobloch[2] had noted cases as long ago as 1843, but it was not till 1902 that the condition was described in detail, by Henneberg and Kock[3]. Their first case was one of von Recklinghausen's disease with multiple neurofibromata of skin and peripheral nerves, extra- and intradural spinal nerves, of ninth and tenth cranial roots, and bilateral acoustic tumours.

Diffuse neurofibromatosis has long been recognized as a familial disease; in 1882 von Recklinghausen[4] stated that it was due to 'congenital disposition.'

Cases of bilateral acoustic neurofibromata as a particular form of the disease, with or without generalized fibromatosis, are comparatively rare.

REPORT OF PERSONAL CASES.

In this series three members of the same generation suffered from the disease; two presented double acoustic tumours (one with generalized neurofibromatosis) and one with neurofibromatosis of the spinal cord only.

* From the Maudsley Hospital, Denmark Hill, London.

CASE I.

Clinical History.—Mrs. A. G., aged 41, was admitted to the Maudsley Hospital on July 2, 1931, complaining of deafness and difficulty in walking. The previous history was negative. She was a married woman with three children, all of whom were quite healthy. About three years ago she fell and hurt her right eye, since when she had had difficulty in seeing. She noticed no further change until September, 1930, when on going to work one morning she became somewhat deaf. She ignored this and continued working until Christmas 1930. About twelve weeks ago she became totally deaf; to use the patient's own words ' my ears felt tight and a cold feeling stretched inside my head from one ear to the other across my forehead.' She began to have difficulty in walking; she was noticed to stagger and had trouble in grasping things. She also suffered from headache, not localised to any particular region of the head. She stated that tinnitus, worse in the right ear, preceded the deafness and was like the tinkling of bells.

On Examination.—She was a poorly nourished woman with a rather vacant expression. Her mood was somewhat depressed, but at times she treated the examination with undue levity, and showed some degree of ' Witzelsucht.' She was disorientated for place but not otherwise.

Her memory was somewhat impaired for recent events, otherwise good: there was no evidence of delusions or hallucinations.

There were a few small patches of café-au-lait pigmentation over the extensor surfaces of both forearms, like large freckles.

Neurological Examination.—Well-marked papillœdema was present in both eyes, with a few hæmorrhages and areas of exudate. Oscillating horizontal nystagmus was present to both sides. An area of analgesia and loss of appreciation of light touch was present over the right supraorbital region, and one of hyperæsthesia to heat and cold in the right temporal region. Corneal and conjunctival reflexes were absent on both sides. The face was asymmetrical at rest, and the left side moved better than the right; the right side of the forehead wrinkled less than the left and the right orbicularis oculi was weaker than the left. There was complete bilateral deafness; neither the cochlea nor vestibule was in function. A tuning-fork was not heard on the vertex. There was neither air nor bone conduction, and no response to rotation or caloric tests. She suffered from vertigo and tended to fall chiefly to the right and backwards. Speech was slurred and tended to be staccato; syllables were missed out.

Rombergism was marked and was unchanged with eyes open. Her gait was markedly ataxic and the movements were jerky. There was no paresis, wasting or fibrillation of the arms or legs, but both were markedly ataxic; intention-tremor, adiadochokinesis and cerebellar defect of movements were present. Past-pointing was present in both hands and spontaneous deviation on the right side. All the deep reflexes were equal in the arms and greatly increased. Sensation was normal in the arms but thermal sensation was impaired in the left lower leg. The deep reflexes in the legs were all increased and equal, double ankle clonus was present and the left plantar was extensor. The abdominal reflexes were all absent. No sphincter impairment was found. Writing was jerky and tremulous. There was no aphasia, apraxia or astereognosis. Right lumbar scoliosis of the trunk was remarked.

Laboratory Examination.—Blood W.R. and Meinicke negative. Blood urea 15 mgrm. per cent. Blood count: 4,160,000 reds: Hb. 11·8 grm. per cent. Colour index: 0·9; whites: 12,000; polymorphs 67 per cent.; lymphocytes 28 per cent.; hyalines 3 per cent.; basophils 1 per cent.; eosinophils 1 per cent.

Urine normal.

X-ray of head showed an area of calcification to the right of the mid-line (see fig. 1).

The spinal fluid was not under pressure but was slightly turbid. W.R. negative; no increase of cells. Protein 50 mgrm. per cent. Lange: 4433210000. Pandy: positive. Blood pressure: 130/90. Arteries thickened.

Course.—Patient complained of increasingly severe headache, became incontinent of urine and died on August 15, 1931.

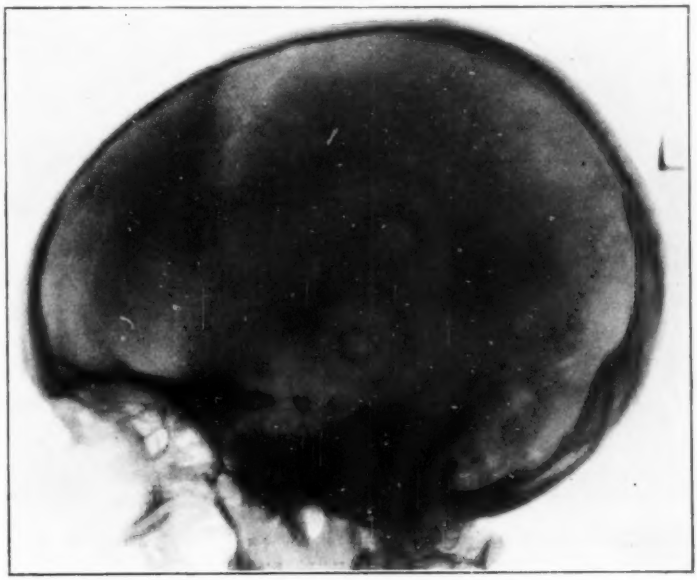

FIG. 1.—X-ray of head of Case I. showing area of calcification to the right of the mid-line.

CASE II.

Clinical History.—The patient E. B., aged 34, was admitted to the Maudsley Hospital on July 13, 1931, suffering from deafness and difficulty in walking. The previous history was normal. He was a married man with three children, one of whom is mentally defective. Ten years ago he knocked his left elbow and developed two 'lumps' over the left olecranon. These were removed, together with an osteoma of the third rib. The former were examined and found to be neurofibromata. No further change occurred until two years ago when he began to develop 'lumps' on the arms and legs.

Two and a half years ago he began to become deaf, and this deafness has increased, especially in the right ear. He is now almost totally deaf. He also has buzzing tinnitus in both ears. At times he feels giddy and tends to fall forwards. Two years ago he also began to have weakness in both hands and the right leg, and

had to give up work. The 'lumps' are painful, 'like toothache in the arms'; he has tingling and numbness especially at nights.

On Examination.—A poorly nourished man, rather depressed as a result of the pain and insomnia. Memory and orientation were correct and there was no evidence of delusions or hallucinations.

Distribution of neurofibromata.—One the size of an egg was present on right common peroneal nerve and some small ones were found on the right lower limb. There were one each over the left common peroneal and anterior tibial nerves and several smaller ones on the left lower limb. Both ulnar nerves were thickened and on the left was a swelling the size of an egg. There were many on both arms, ranging from the size of an egg to a small pea. They were also present in the interosseous spaces, over the sternomastoid, in the left axilla, supraclavicular region, over the thyroid cartilage and behind the left ear. Both vagi appeared to be beaded and thickened.

All the tumours were hard, firm, and definitely encapsulated. They were not

FIG. 2.—Photograph of arm of Case II. showing nodules, pigmentation and wasting of small muscles of the hand.

pedunculated, and moved transversely but not horizontally. Those over the ulnar and peroneal nerves were painful and produced numbness and tingling in their areas of distribution. There was marked patchy café-au-lait pigmentation over the back of the neck and extensor surfaces of both forearms in the form of freckling (fig. 2). It was present also on the back, upper arms and anterior aspects of both thighs, but not to such a marked extent.

Neurological Examination.—Thermal anæsthesia was found in left supraorbital region; the left conjunctival reflex was absent. Left lower face moved less than right; tremor of left face and fibrillary twitching of left eyelid were present. Shouting was heard in left ear only. Weber: referred to left. Rinne: right, not heard by bone or air; left, negative. Bone conduction in left only. Rotation tests: no response; caloric tests: no reaction either side; past-pointing not marked, only a little inaccuracy on right side.

Labyrinthine function completely lost on right side. Static labyrinth in abeyance left side; still some cochlear function. Tongue tremulous, deviating slightly to right side.

Rombergism present; tended to fall in any direction. Gait not ataxic; walked with limp due to neurofibroma behind knee. Weakness of both hands; left greater than right. Extension of wrists weak. Wasting of interossei and muscles of thenar eminences present, more marked on left side. Fibrillary twitchings present in extensor and flexor muscles of both forearms. Intention tremor of

FIG. 3.—X-ray of right labyrinth of Case II. showing expanded internal auditory meatus and destruction of semicircular canals.

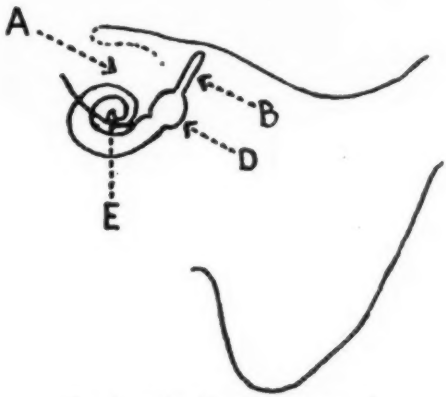

FIG. 4.—A tracing of this X-ray. For explanatory notes see fig. 6.

hands present. Patchy analgesia to pin prick present in both hands and arms, more marked on left side. Patchy thermal anæsthesia in same distribution also. Right biceps jerk present, left sluggish, all other deep arm reflexes absent. Wasting of right thigh and leg muscles. Extension and flexion of right knee and plantar and dorsiflexion of foot weak.

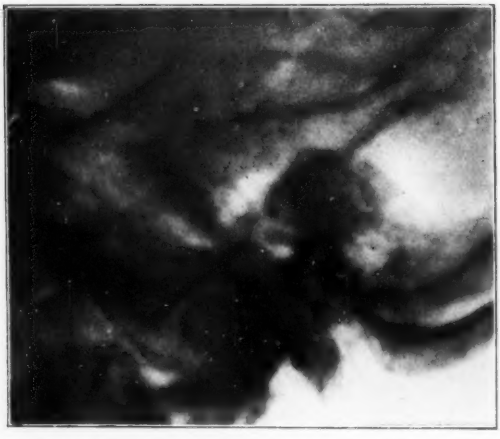

FIG. 5.—X-ray of left labyrinth of Case II. showing destroyed internal auditory meatus and semicircular canals.

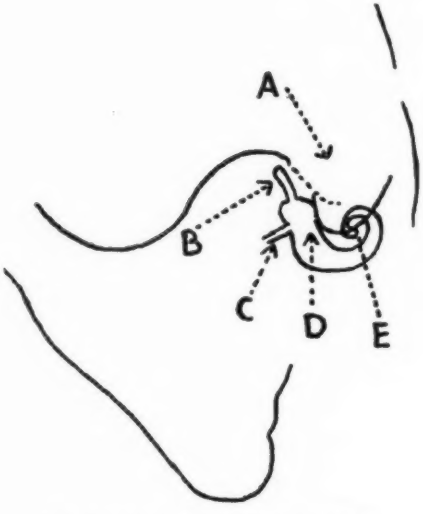

FIG. 6.—A tracing of the X-ray of fig. 5.

A Destroyed internal meatus
B Superior canal
C External canal
D Vestibule
E Cochlea

No cerebellar signs in arms or legs. Vibration sense and light touch absent in right lower leg. Thermal sensation impaired in both legs and feet from knee downwards. All deep reflexes in legs absent. Right plantar equivocal. Abdominal reflexes all sluggish and right lower one absent.

Pes cavus right foot: both feet cold and blue.

R.D. or partial R.D. present in extensors and flexors of right forearm; extensors and flexors of wrist and fingers; interossei; and extensors of right knee and left foot. Present in left palmar interossei and intrinsic muscles of foot.

Laboratory Examination.—Blood W.R. and Meinicke negative. Blood urea 18 mgrm. per cent.

Urine normal.

Blood count: reds: 5,200,000. Hb. 12·6 grm. per cent. Colour index: 0·9. Whites: 6,400; polymorphs 73 per cent.; lymphocytes 24 per cent.; hyalines 5 per cent.

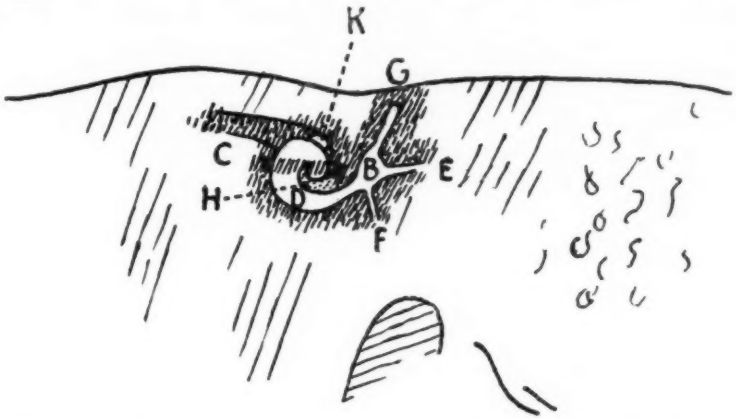

FIG. 7.—Tracing of X-ray of normal labyrinth for comparison (after H. Graham Hodgson).

B	Vestibule	F	Posterior canal (lowerend)
C	Internal auditory meatus	G	Superior canal
D	Basal coil of cochlea	H	Modiolus
E	Lateral canal	K	Seventh nerve opening

Spinal fluid not under pressure and clear. W.R. negative; cells 3 per c.mm. Protein: 200 mgrm. per cent. Lange: 5555554321 (excess of globulin over albumin). Blood pressure: 125/85.

X-ray of skull showed that the right internal auditory meatus was very much expanded: on the left side it was completely absent. The appearances suggested bilateral eighth nerve tumours (see figs. 3, 4, 5 and 6).

Course.—The patient gradually became more deaf and had greater difficulty in walking; left face was extremely weak; left eyelid did not blink. Horizontal nystagmus was noted: slow phase to left and quick to right. Double optic atrophy was present.

CASE III.

The youngest boy died at the age of 15 and the facts relating to him were as follows. Eight months prior to his death he began to have progressive loss of power in the left arm and leg. Later partial loss of

power in the right arm developed, followed by wasting. Incontinence of urine supervened. These symptoms were said to have followed a fall on his shoulder one year previously. Thermal sensation in the hands was affected and the deep reflexes were exaggerated. The boy became thin and wasted; the small muscles of the hands were wasted, also the forearms. Deep arm reflexes were absent. Marked spasm of both legs were present. Deep reflexes were increased in the legs; abdominal and cremasteric reflexes were absent. Plantar responses were doubtful. He gradually became weaker, became incontinent of urine and fæces. A double extensor response and ankle clonus were present. Sensation to touch was impaired from three inches above the umbilicus downwards. The abdominal muscles were weak and spastic paralysis was present in legs. A post-mortem examination was held; the dura was found adherent from the seventh dorsal vertebra to the lower border of the third cervical. The tumour involved the motor roots principally, but had invaded sensory roots on the right side.

Unfortunately there is no report of a microscopic examination of the tumour. Neurofibromata are found fairly commonly growing from the nerve roots and causing compression of the spinal cord. Alexis Thomson[5] reports a case of compression myelitis due to this cause, with generalized neurofibromata. Other authorities also describe cases where tumours have been found growing from the nerve roots with generalized neurofibromatosis; but just as the patient A. G. had bilateral acoustic neurofibromata without generalized neurofibromata the supposition is that this patient suffered from the same condition affecting the cord only.

X-RAY APPEARANCES.

X-ray of the head in cases of bilateral acoustic tumours often shows enlargement and distension of the internal meatus, as the tumour usually originates from that portion of the nerve lying within the canal. Henschen[6] showed, as did Cushing, that in some cases of unilateral tumours this distension may be seen on the side opposite to the lesion. Graham Hodgson[7] has found that X-ray of the head in cases of eighth nerve tumours may show destruction of the labyrinth and semicircular canals.

Case II shows these features very well. On the left side the internal auditory meatus is completely absent and destruction of the semicircular canals has taken place (see figs.).

BONY CHANGES.

Bone changes in neurofibromatosis are fairly common and Brooks and Lehman[8] have described these in some detail. They describe scoliosis, abnormalities of growth and irregularity of the shafts of long bones appearing in X-ray films as subperiosteal cysts. Microscopic examination of the bone cysts shows the central portion to be composed of tissue similar to that in skin tumours with new-formed bone trabeculæ. These cysts are due to neurofibromata of bone in the periosteum setting up reaction, with resulting bone destruction and regeneration. A thin layer of bone is then formed over

the tumour if the osteogenetic element of the periosteum comes in contact with it, and so gives the X-ray picture of a subperiosteal cyst.

If the tumour growth involves the epiphyseal cartilage an abnormally short bone may result. If it involves the shaft and if it is associated with hyperplastic change in the lymphatics the entire bone is rendered more porous and plastic. This causes growth in length of the bone, which is distributed throughout the entire bone instead of being confined to the region of the epiphyseal cartilage.

Weiss[9] described scoliosis in 15 cases and Ashton[10] a case of neurofibromatosis with spontaneous fractures. Parkes Weber[11] agrees that bone changes in this disease are due to neurofibromatous involvement of the periosteum. It is interesting to note that in Case II an osteoma was removed from the ribs several years ago. The patient had a right pes cavus and a tendency to the same condition in the left foot. In Case I the patient showed a right lumbar scoliosis, but no other changes in the osseous system, while the father had one leg shorter than the other. The long bones of both patients were X-rayed for evidences of subperiosteal cysts, etc., but no abnormal appearances were found.

HEREDITY AND ETIOLOGY.

Preiser and Davenport[12] collected thirty cases of a familial type in which two or more members of a family were affected. According to them the disease seems to reappear in both sexes of successive generations, in accordance with Mendelian law. It must, therefore, be assumed that there is a defect in the germ-plasm which leads to the production of tumours of the nerve under appropriate stimulation. These stimuli are said to be irritation from clothes, infections, pregnancy and endocrine disturbances, but in many cases the tumours are already present and only increased by these factors.

Gardner and Frazier[13] described a family of five generations with 217 members, 38 of whom had bilateral deafness. They state that since 1915 only 18 verified cases of bilateral acoustic tumours associated with neurofibromatosis have been described, and two without other generalized signs. Henschen[14] collected 24 cases of bilateral tumours, 19 of which were associated with other evidences of von Recklinghausen's disease, thus making a total of 37 cases with neurofibromatosis and seven which were unassociated with other signs of the disease. Cushing[15] collected 13 cases of bilateral tumours of the auditory nerves and dural tumours also. Unilateral tumours are much more common. Penfield[16] has separated the two types on a pathological basis. The isolated tumours contain nerve-fibres in the capsule only, but in the case of neurofibromatosis nerve-fibres in practically all the cases penetrate the tumours, which constitute true neurofibromata. Skinner[17] stated his belief that the type-cell of these tumours is the neurilemma

sheath cell, and gave reasons for showing that they existed in unusual numbers on the vestibular portion of the nerve. Henschen stated that the tumour originated on the vestibular portion of the nerve and Gardner and Frazier in their series demonstrated this also. Cushing[18] states that six per cent. of all intracranial and 20 per cent. of posterior fossa tumours are acoustic in origin and gives the ratio of 1 bilateral to 100 unilateral tumours. He considers that the tumour lies in the internal auditory meatus, which is enlarged on the side of the tumour. He also states that the tumours are closely akin to the peripheral tumours of Recklinghausen's disease and differ only in their greater tendency to the formation of glia-like areas and in the absence or extreme rarity of myelinated or bare nerve-fibres.

Many authorities regard these tumours as being due to an anlage and of embryonal origin; Sternberg[19] attributed them to an anlage of glia tissue which might be either in the nerve itself or outside of it, thus explaining the cases in which the nerve spanned rather than traversed or became lost in the substance of the tumour. Orzechowski[20] believes that cerebellopontine angle tumours arise more often from an anlage of the middle wall of the recess than from the nerves. Cushing disagrees with Penfield in regard to the histology of these tumours and states that unilateral tumours are related to bilateral tumours with Recklinghausen's disease, as their histology is identical; and that in all probability they are due to the same underlying anlage which may be regarded as more likely to occur in the eighth than the other cranial nerves.

Collagen fibres in a tangled mass are found in the tumours, like the connective-tissue fibres which run in the endoneurium of a normal nerve parallel to the nerve bundles. In view of the presence of connective-tissue increase about the fibres of the nerve, Trotter[21] suggested that these tumours appear because of a lack of proper insulation of the nerve fibres themselves with a resultant stimulation of connective tissue. He suggests that nervous tissue is normally insulated by specialized cells and when this insulation is inadequate the nervous tissue acts as an irritant. Herxheimer and Roth had previously maintained that the pathological process involved was a dystrophy or hyperplasia of nervous tissue resulting from the weakness of some specific element and that the connective-tissue growth was of the nature of a reaction.

Several authorities have described endocrine disturbances with diffuse neurofibromatosis. Kawashima[22] described a case of suprarenal tumour in one case and Tucker reports nine cases associated with endocrine disturbances, viz., one with persistent thymus, three with acromegaloid manifestations and in seven cases there was excessive pigmentation and low blood pressure, denoting suprarenal involvement. Roubinovitch and de la Sourdière[23] found acromegaloid changes in a mother and son with neuro-

fibromatosis. Barber and Shaw[24] reported a case with bilateral optic atrophy, sexual precocity and a shadow in the sella turcica thought to be that of a tumour (not confirmed). Leir[25] found dystrophia adiposo-genitalis with X-ray and ophthalmoscopic changes suggesting pituitary tumour (not confirmed).

These endocrine disturbances associated with neurofibromatosis appear to be too rare and inconstant to be seriously considered etiologically.

From the above accounts it will be seen that the familial characteristics of diffuse neurofibromatosis and double acoustic tumours are well known and are thought by many to be due to some defect in the germ-plasm.

The three patients described had another brother who died suddenly in boyhood, but unfortunately the cause of death was not known. Both patients (Cases I and II) had three children each, and apart from the fact that the youngest child of the second is a mental defective they are all alive and well. The father of the generation described is alive, age 70, and has been a cripple from birth, but no other signs of neurofibromatosis could be found in him, or any other members of the family who were examined. In addition careful enquiry into the histories of members of the family not seen produced no evidence of the disease.

MORBID ANATOMY AND HISTOLOGY.

The histology of the tumours was first studied by Virchow[26] who considered them neuromata. In 1881 von Recklinghausen[27] named them fibromata and in 1896 Pierre Marie considered that the tumours of the nerves and the skin differed in that the former arose from the sheath cells and the latter from the fibrous tissue of the skin. In 1900 Alexis Thomson[28] stated the tumours arose from the endoneurium. Durante[29] considered that the tumour arose from the proliferation of the sheath cells or, as he called them, the ' cellules segmentaires ' which according to his view formed the axis-cylinder, and he named the tumours ' neuromes vraies segmentaires.' He noted also ' large polygonal multinucleated cells ' and ' stellate cells with elongated nucleus ' in the more myxomatous part of the tumour.

Verocay[30] reviewed the subject and considered that the cells composing neurofibromata were undifferentiated neurocytes, capable of giving rise to ganglion or glial cells or to cells of the sheath of Schwann. The tumours of the acoustic nerve he considered to be in their histological characteristics neurofibromata. He called all these forms of tumour ' neurinomata ' (nerve thread tumours). Cushing[31] considers that tumours of the eighth nerve arise from undifferentiated cells at the junction of the glial elements with the sheath of Schwann. This takes place

at a considerable distance from the brain-stem, which is probably greater in the vestibular than the cochlear nerve. This ' transition zone ' is probably an area of unstable equilibrium and may be more so in the eighth nerve than in the other cranial and spinal nerve roots, as it is to be noted that most cases of multiple tumours of the nerve roots (central neurofibromatosis) are associated with bilateral acoustic tumours. In Verocay's case and in one of Cushing's ganglion-cells were found in acoustic nerve tumours. Verocay considers them to be an integral part of the tumours and Cushing agrees (previous writers considered them to be pre-existing ganglion-cells in relation to the nerve). Cushing remarks that tumours of the nerve tend to show hyaline degeneration of vessel walls and states that impoverishment of blood-supply may result in fibrosis and deposition of calcareous salts in fibrous tissue. This indicates that cases of multiple psammomata of the nerve roots are neurofibromatous in origin. Cushing also states it is not unusual to have multiple endotheliomata of the cerebral and spinal meninges present in cases of central neurofibromatosis.

Greenfield[32] states that the tumours are composed of cells which resemble the connective-tissue type in having an elongated nucleus and cytoplasm which tails off into a spindle-shaped process at either end, but which differs from it in staining reactions, e.g., with van Gieson's stain, which gives the process more of a brick-red colour than the pure fuchsin staining of connective-tissue. The cells have a tendency to palisading (Cushing), nucleus lying by nucleus and cytoplasm by cytoplasm, giving a banded appearance to the section. Greenfield goes on to say that in addition there are areas of a looser texture in which multinucleated cells are common and the ground substance formed of small rounded cells and scanty cytoplasm which tends to run off into several thin poorly formed processes—a type of cell suggesting myxomatous or glial tissue. No nerve fibres were found by silver-staining methods in any of the tumours examined.

Gamper[33] in an article on the pathology of the central nervous system in this disease found neurinomas of the vagi, multiple gliogenous tumours of the ventricles, two subependymal tumours of neurinomatous structure resembling glial infiltration in the region of the spinal root and ganglion of the left fifth nerve. He described accumulation of pigment with proliferative changes in the glia of the reticular zone; also blastomatous cell proliferation and diffuse loss of myelin fibres in circumscribed areas of the frontal lobes and cerebellum. Nodules like those of nodular sclerosis were found in the cerebellum. The meninges were thickened and there were angiomatous formations on the blood-vessels.

PATHOLOGY OF PERSONAL CASES.

CASE I. *Macroscopic appearances of the growths.*—When the brain was removed and examined, two growths were found in the right and left

cerebellopontine angles respectively, that on the right side being the larger of the two (fig. 8). Owing to the situation of the growths the seventh, eighth, ninth and tenth cranial nerves on both sides were concealed, and it was only by slightly raising the growths that these nerves could be seen, flattened and pressed against the sides of a deep depression formed by the growths. Both tumours were easily detached and seemed to be retained in position by thin strands of arachnoid. Superficially no direct connection

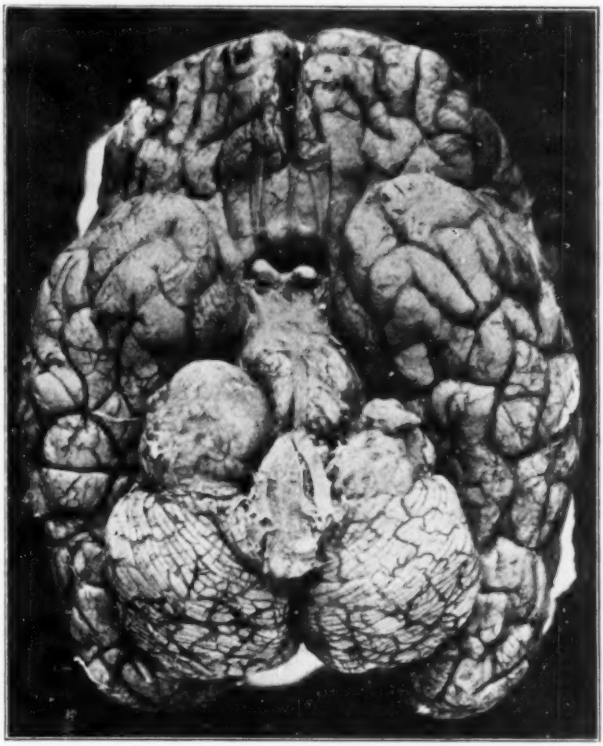

FIG. 8.

could be established between them and the underlying cranial nerves. The latter were quite free and did not appear to have been attached to them, although it is quite possible that owing to the position of the growths, lying on the nerves, any slender connection may have been severed during removal.

The weight of the tumour on the right side was 25·5 grms.; the left, 8·5 grms. The large growth on the right side was found to be very soft and cystic. After suitable hardening it was sectioned and found to consist

of a large core of coagulated material resembling colloid, with a thin capsule of tissue enveloping it. In one part this capsule was slightly thickened and a section of this showed it to be neurofibromatous in appearance. The smaller growth was of a firm nature throughout with the exception of one or two very small cysts in the centre.

The growth on the right side had formed a deep circular fossa affecting principally the middle and lower thirds of the pons and the anterior part of the cerebellum exposing the middle and inferior cerebellar peduncles, and

FIG. 9.

had pressed on the lateral aspect of the medulla causing distortion of the pyramid and inferior olivary body (fig. 9). The growth on the left had not formed such a deep fossa, and the damage seemed to be limited to the anterior part of the cerebellum and the middle and inferior cerebellar peduncles.

In addition to the two large growths described, a number of small nodular growths were found affecting the following cranial nerves. On the left side: seventh nerve, small nodule 1 mm. in diameter; eighth nerve, several small nodules, one of which was about 3 mm. in diameter; twelfth nerve, small nodule 2 mm. in diameter.

On the right side, owing to the pressure of the large growth combined with the depth of the fossa it was found difficult to identify with accuracy the seventh and eighth nerves, but on one of these nerves, presumably the eighth, there were several small nodules, which had coalesced and matted the branches together, forming an elongated growth 5 mm. in length and 2·5 mm. in breadth; on the twelfth nerve, small nodule.

A small growth was also found attached to the dura mater in the posterior fossa, and this was found microscopically to be an endothelioma. The remainder of the brain and nervous system was normal in appearance.

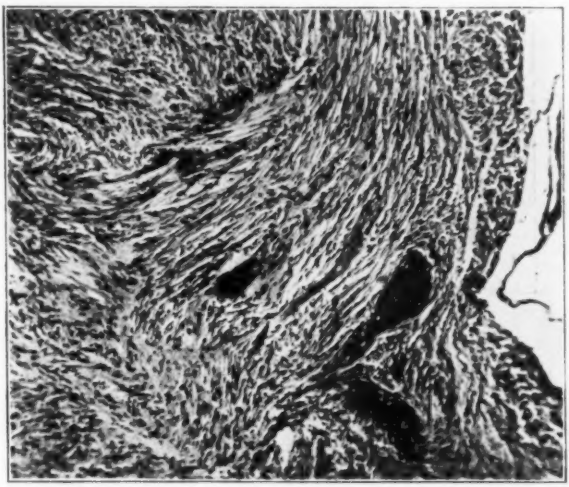

FIG. 10

Microscopical Examination.—The two large growths and the small growths on the cranial nerves were identical in character and were typical neurofibromata. They consisted of elongated cells arranged both in bundles and whorls, and presented the usual palisade arrangement (fig. 10). There were areas in the growths which were myxomatous in type. The small growths in the cranial nerves were looser in structure than the large growths and presented a more whorled appearance than the latter. This was well seen in the eighth right cranial nerve which macroscopically showed small multiple growths coalesced to form one large growth, but microscopically presented the appearance of a number of small circumscribed growths separated from each other by a thin fibrous capsule (fig. 11). A number of typical neuroglia cells were seen in the growths on the cranial nerves, but were not found in the large growths. Parts of the large growths were prepared by the Bielschowsky silver method for demonstrating nerve fibres, but the results

were negative. In spite of staining sections in a variety of ways, no nerve fibres were found in them.

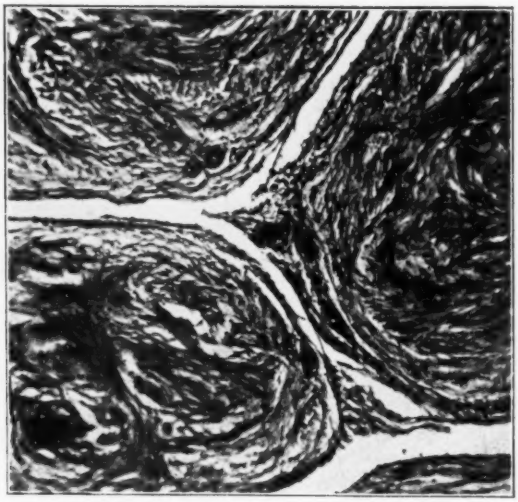

FIG. 11.

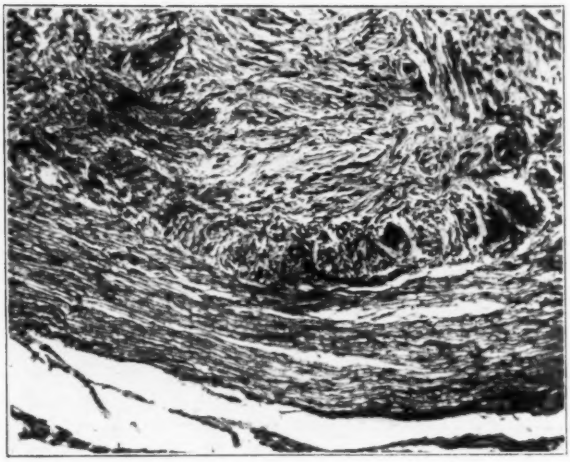

FIG. 12.

As already stated, the histological structure of the large growths and the growths in the cranial nerves was identical, but in the case of the latter

it was possible to cut the nerve and growth in the same section and trace the relationship to each other. The small growth on the twelfth right cranial nerve could be seen attached to the nerve, and it was possible to trace the nerve to the edge of the growth where it was seen to divide into two distinct

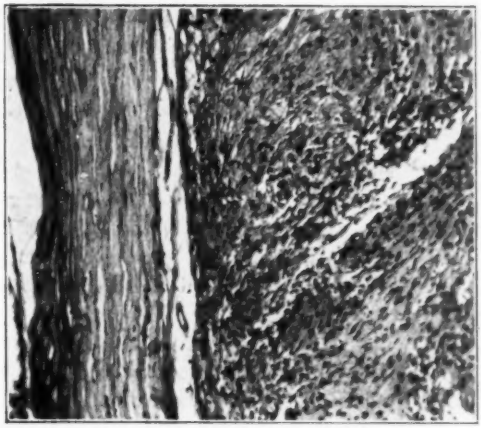

FIG. 13.

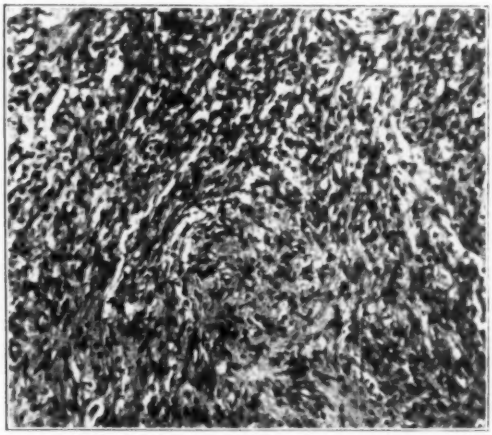

FIG. 14.

branches. One branch merged into the growth without any definite line of demarcation and the axis-cylinders ended abruptly. The other branch passed round the outer border of the growth, retaining its nervous structure, and continued on the other side of the growth (fig. 12). At the summit where

the nerve passed over there was a small elongated area of loose reticular tissue between the more fibrous part of the growth and the nerve proper, suggesting that the growth may be derived from the neurilemma sheath. A similar appearance was noticed in the growths on the other cranial nerves.

Case II.—The growth removed by operation from the arm in Case II was enclosed by a thick capsule of fibrous tissue (fig. 13). Its character was that of a neurofibroma and resembled the growths described in Case I, although the areas of myxomatous tissue were not so numerous (fig. 14). No myelinated nerve fibres were demonstrated by the Bielschowsky or any other method.

SUMMARY.

I. The form taken by the disease in three different members of the same generation is interesting, in that one suffered from double acoustic tumours only, one from spinal tumours only, and one from double acoustic tumours and generalized neurofibromatosis.

II. In spite of examination of most of the living members of other generations, no signs of neurofibromatosis could be found in them, and a careful search into the histories of others that were deceased brought to light no data suggesting its occurrence.

III. In all three patients a blow preceded the first signs of the disease, the trauma in each case being local; in Case I it was on the head, in Case II on the elbow, where two lumps appeared, and in Case III on the shoulder. It is probable, however, that the trauma merely first drew attention to the disease.

IV. Bone changes were present in two cases. E. B. had an osteoma of the rib removed some years ago, and pes cavus, and A. G. had a right lumbar scoliosis.

V. Motor disturbances due to local nerve involvement in the form of wasting are said by Harbitz[34] to be rare and sensory changes uncommon. This he says is due to nerve-fibres persisting in the tumours without degenerating, or to a diffuse infiltration of the nerves. Case II showed marked wasting of the small muscles of the hands and of one leg and thigh, but there was no evidence of a spinal cord tumour pressing on the nerve roots as in the case of the youngest member, who died. Sensory disturbances were also present in the hands and feet in the form of anæsthesia and paresthesiæ.

VI. From the literature it will be seen that bilateral acoustic tumours with generalized neurofibromatosis are much commoner than bilateral acoustic tumours only, and that unilateral tumours are much less rare than the bilateral ones.

VII. The cerebrospinal fluid in both cases was interesting. In Case II

the Lange curve was typically paretic. This according to Cruickshank[35] and others depends on relative increase of globulin in proportion to albumin. The protein was 200 mgrm. per cent. and gave a positive Pandy, whereas the cells were only 3 per cent., giving rise to the 'dissociation albuminocytologique.' In Case I there was no increase of cells; the protein was 50 mgrm. per cent. and the Lange curve 4433210000, showing a tendency to the same condition. Foix[36] and Boveri[37] consider this to be characteristic of tumour of the brain or spinal cord, but it is by no means typical. Greenfield and Carmichael[38] think that any great increase of protein indicates that the tumour is either in the posterior cranial fossa or in close relation to the walls of the ventricles.

The same authors[39] state that neurofibromata of the acoustic nerve are usually associated with increase of protein without lymphocytosis. They describe a case with 175 mgrm. protein and 1 cell, and they think that the protein has a similar origin to that in glioma of the ventricular walls and is due to transudation from the tumour into the region of the large subtentorial cisterns.

VIII. It will be seen that in this series tumours containing nerve tissue only and others with myxomatous tissue were found. The tumours were found on not only the eighth, but the seventh and twelfth nerves also, with in addition an endothelioma of the dura.

In this series no medullated nerve fibres could be found in the tumours nor were any of the changes in the nervous system mentioned by Gamper present.

I wish to thank Dr. Edward Mapother, Medical Superintendent, for permission to publish these cases, and Dr. Graham Hodgson for his kindness in preparing the tracings of the X-ray photographs.

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THREE FATAL CASES OF THE BULBAR TYPE OF POLIOMYELITIS.

By

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In the course of an investigation on an epidemic of brainstem poliomyelitis reported in a previous paper, a search was made for similar though fatal cases in order that the pathology might be studied. The three now reported were cases of poliomyelitis of the brainstem type without any spinal involvement and were the total outcome of the search. One case comes from the notes of the Hospital for Sick Children, Great Ormond Street; one from the records of a Metropolitan Asylums Board Hospital; and the third from the Pathological Department of the National Hospital, Queen Square, the case having been treated privately.

EPIDEMIOLOGY.

It is of interest that in two of these cases the patients had tonsillectomy performed shortly before the onset of symptoms of poliomyelitis. The first patient had enucleation of tonsils performed at Great Ormond Street Children's Hospital 14 days before her admission to the same hospital; she died there on the following day and the diagnosis of recent acute bulbar poliomyelitis was confirmed by histological methods. The first symptoms appeared 11 days after tonsillectomy. In Case 2, prodromal symptoms of poliomyelitis developed 15 days after tonsil enucleation, and a cranial nerve paralysis on the next day. Histological evidence proved the condition to have been poliomyelitis of the brainstem type.

Aycock and Luther (1929), investigating 1,224 cases of poliomyelitis, found that 16 had developed the disease within one month of an operation for removal of the tonsils, and that all of these occurred between the seventh and the sixteenth days inclusive.

It would appear that the operation of tonsillectomy gives an opportunity for the virus, if previously present, to assume its neuropathic tendencies or to gain access to the nervous tissues by implantation at the time of operation or afterwards. It is suggested that there must be some natural barrier in the pharynx which normally wards off the infection before the central nervous system is invaded, and this would account for the fact that pharyngitis is present in a great number of cases. Latent immunity is undoubtedly conferred by this pharyngitis without a spread of the infection to the central nervous system (Fairbrother and Scott Brown, 1931).

Two of these collected cases confirm Aycock's findings and make it probable that the incubation period of poliomyelitis is between seven and 16 days.

CLINICAL SUMMARY.

In each case the onset of the illness was sudden, being associated with a sore throat, cough, a raised temperature to about 101° F. and a correspondingly increased pulse-rate. Vomiting was present in all the cases and was one of the earliest symptoms in two.

Symptoms due to involvement of the central nervous system.—*Headache* was complained of in one case on the day of onset, otherwise it was not a marked feature. There was no head retraction or stiffness of the muscles of the neck in any. In Case 2 spasticity of the upper extremities, with loss of reflexes in the lower, occurred; and in Case 3 loss of reflexes in upper and lower extremities as a terminal sign. There was no *paralysis* of the upper or lower extremity in any case. Tremor of the fingers was not observed.

Symptoms due to involvement of the cranial nerve nuclei.—In two cases signs of involvement of cranial nerve nuclei occurred on the third and fourth days of the illness respectively.

III, IV, VI. In Case 2 *ptosis* and internal *strabismus* were observed on the day the patient died and were probably due to involvement of the third and sixth nuclei.

V. In this case, also, trismus due to irritation of the fifth nucleus was present, and was the first sign of nerve involvement.

VII. *Facial paralysis* occurred as a terminal event in Case 2.

IX, X. These nuclei are considered together as both are probably concerned to some extent in the production of a *nasal voice*, *dysphagia* and *choking*, which were constant symptoms in these cases.

A palatal paralysis was not observed in spite of the development of a nasal intonation. Dysphagia was associated with choking when swallowing was attempted. The second patient also developed attacks of dyspnœa but laryngeal stridor was not present.

CASE NOTES.

CASE 1. D. D., age 2½ years, female.

Two weeks before her admission to Great Ormond Street, tonsillectomy was performed at the hospital. Ailing since, and refused solid food. Four days ago, vomited, was constipated, and had cough. Two days ago, throat appeared to become more sore.

Condition on admission (fourth day of illness) T. 101°, P. 144. A well-nourished child, pale, looked ill, irritable when disturbed. On the attempt to give the child fluid, it choked, and was unable to swallow; the palate moved well. Throat generally red and infected. Tonsil area healed, no membrane or ulceration. Central nervous system appeared normal on examination.

Sixth day of illness. T. 101°, P. 160. General condition appeared worse; cyanosed; cough and choking attacks repeated, with inability to swallow. Palate moved well. A nasal feed caused violent choking and there seemed to be inability to get the food out of the throat. At 6 p.m., collapsed during nasal feed. At 11 p.m., pulse almost imperceptible.

Lumbar puncture was performed and a small quantity of almost pure blood was obtained. Patient died immediately afterwards.

Post-mortem Examination—Macroscopic Appearances.

Lungs	congestion.
Liver	congestion.
Spleen	normal.
Mesenteric glands ...	definitely enlarged.
Cerebrum	natural on outer surface, in the ventricles and in its substance.
Cerebellum	natural.

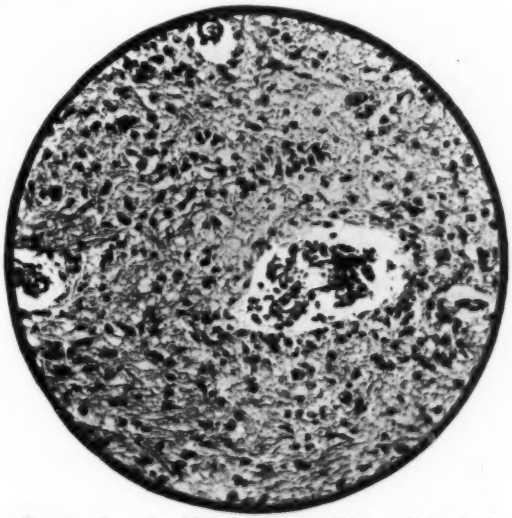

FIG. 1. Case. 1. Medulla. Shows diffuse cellular infiltration of the grey matter with a localised collection around a small blood vessel. x 150.

Lying over the anterior surface of the *medulla* and *pons* was a thick clot which appeared to be recent. There was no clot on the posterior surface of the medulla but it extended downwards and surrounded the whole cord in the lower dorsal region, making the membranes tense. The clot was inside the pia mater and it stripped off the cord easily. No vessel could be found from which bleeding had taken place and the cord substance appeared normal. Vessels of the medullary region appeared congested. On section small areas of congestion could be seen.

Microscopic Appearances.—Sections of the cord through the lower dorsal region show the surrounding hæmorrhage with congestion of the meningeal vessels but no evidence of poliomyelitis in the grey matter. Sections across the medulla at the level of the middle of the olivary body show histological changes typical of poliomyelitis. There is a diffuse infiltration throughout the grey

matter though limited to it; more localised and intense infiltration is seen about the nucleus ambiguus, the nucleus of the spinal root of the fifth, and the nucleus of the fasciculus solitarius. Perivascular infiltration, and all stages of nerve degeneration and absorbtion by neuronophagic cells are well seen. The infiltration is mainly lymphocytic though a certain number of polynuclear cells are to be found round the vessels (figs. 1 and 2).

CASE 2. Mrs. D., age 35, married.

During the summer of 1929 was unfit and had a slight temperature, with sore throat. October 11: Tonsils enucleated; patient progressed normally though slowly up to October 26, when she was taking ordinary food. Temperature was

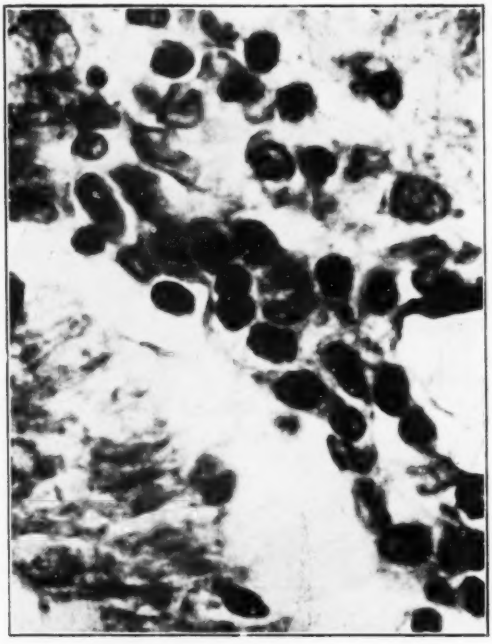

FIG. 2. Case 1. Medulla. An enlargement to show that cells in the perivascular space are mainly lymphocytes with a few polymorphonuclear cells. x 750.

still occasionally 99°. October 27: Did not feel well, did not want food, vomited. T. 101°. Later in the same day, had a feeling of 'something in her throat' which made swallowing uncomfortable, giving rise to a feeling of rawness.

Somewhat later, developed marked trismus, with tonic contraction of masseter muscles. Actual difficulty in swallowing occurred, and a choking attack in which breathing, too, seemed difficult. 10 p.m.: T. 100·2°. Mouth opened half an inch. Speech clear. Tongue clean. Palate moved well. Pharynx could not be seen, as when the tongue was touched the patient immediately retched and vomited. This started an attack of dyspnœa, but without laryngeal stridor. There was much frothy saliva in the throat and the difficulty appeared to be more

pharyngeal than laryngeal. Shortly after, she regurgitated tea through the nose, and the voice became nasal in character. The pharynx was also seen to be dusky and red, with muco-pus running down from above. Digital examination of the pharynx detected no swelling and the manipulation made her easier and made the jaw move better. Nothing else abnormal was discovered in the central nervous system, or in any other system. October 28: After a fairly comfortable night she became worse at noon. Facial weakness developed, also internal strabismus associated with ptosis on one side. Some rigidity of arms and loss of tendon reflexes in both legs. Death occurred the same day.

Post-mortem Examination.—Macroscopic Appearances.—Nothing abnormal is recorded.

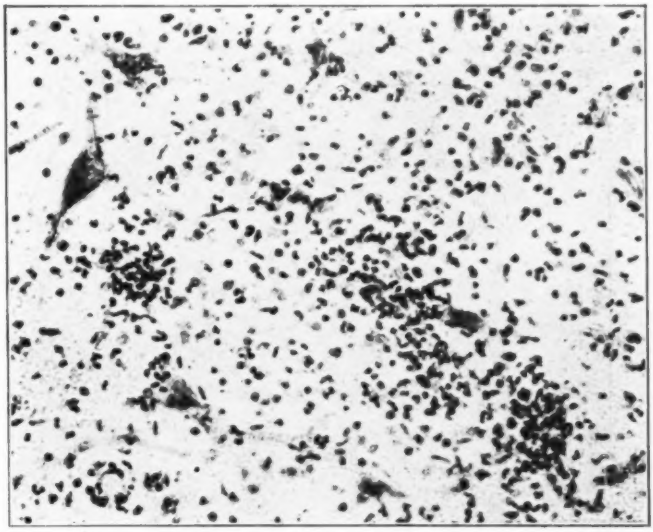

FIG. 3. Case 2. Medulla. Diffuse infiltration of the grey matter with localised collections round cells of the twelfth nucleus. Marked cell destruction.

Microscopic Appearances.—The characteristic changes of poliomyelitis are seen throughout serial sections from the mid-cervical region to the uppermost part of the pons. *Section through C 5*: Diffuse lymphocytic infiltration, not very intense, limited to the anterior horns is seen. Perivascular infiltration is not marked. Neurolysis and neuronophagia are present. *Medulla at decussation of the pyramids*: Diffuse infiltration of the upper part of the anterior horn and the region of the descending root of the fifth. Perivascular infiltration is marked. Neurolysis is present. *Medulla below the calamus scriptorius*: Centred round the calamus is a diffuse infiltration affecting many nuclei. The lowest part of the twelfth nucleus shows infiltration, neurolysis and neuronophagia. *Medulla at the tip of calamus scriptorius*: The main body of the twelfth nucleus is seriously involved. Intense infiltration and cell destruction are seen in the region of the dorsal nucleus of the vagus on one side: the nucleus ambiguus is also affected.

The olives are absolutely intact. *Upper part of the medulla through fourth ventricle*: Diffuse infiltration seen under the floor of the ventricle, with patchy collections not limited to the nuclei. The upper part of the twelfth nucleus is affected and collections are also seen in Deiters' nucleus. The olives and pyramids are free from infiltration. *Lower pons*: The pyramids and nuclei pontis are quite clear. The region of the ventricle and the sixth and seventh nuclei show infiltration and cell destruction. The main motor nucleus of the fifth nerve is much infiltrated on one side. *Upper pons above the middle peduncle*: Substantia ferruginea and the ascending sensory root of the fifth nerve show marked infiltration. *Upper pons, almost midbrain*: Ascending root of the fifth nerve is the only part to show infiltration. The fourth nucleus is clear (figs. 3-5).

CASE 3. S. C., age 17½, female.

Patient was taken ill on September 12, 1929, complaining of headache, pains all over the body, and slight sore throat. Previously she had been in good health

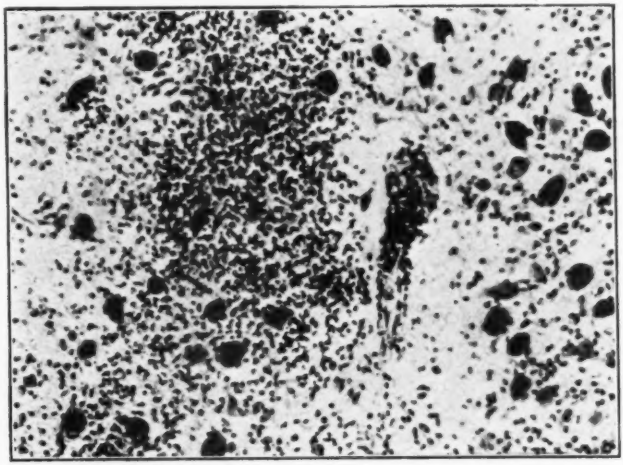

FIG. 4. Case 2. Pons. The motor nucleus of the fifth nerve shows most intense infiltration, with marked neurolysis and neuronophagia.

She felt better the next two days, but on September 15 had to return to bed and the doctor was called in. Had several attacks of vomiting and coughing. Four days later, was unable to swallow and was admitted to hospital.

Condition on admission (seventh day of illness).—Patient was apathetic and complained of general weakness. She was unable to swallow and attacks of choking followed each attempt: a large amount of mucus had collected in the pharynx. Palatal movements were normal. There was paresis in the upper and lower extremities. Knee-jerks were present but sluggish. Abdominal reflexes were absent. There was no sensory disturbance and no ocular paralysis. Pupils were equal and reacted to light. No head retraction was observed. The heart and lungs were normal.

September 21: Rather more drowsy but answered questions intelligently when roused. Inability to swallow persists, with choking caused by mucus in the pharynx.

September 23: Arm and leg reflexes not elicited, but can move limbs voluntarily. Otherwise the symptoms continue as before.

September 24: Died at 2.50 a.m. on the twelfth day of the illness.

Examination of the cerebrospinal fluid.—Slightly under pressure, clear, watery, no clot. Cells: 2 lymphocytes per c.mm. No organisms seen. No tubercle bacilli. Culture showed no growth. Chlorides: 0·75 per cent. Sugar: a trace. Albumin: 0·025 per cent. Globulin: nil.

Post-mortem Examination.—Surface of brain, cord, and meninges was normal. Congestion of the grey matter in the cervical region with small punctate hæmorrhages in the anterior horns. The brainstem showed a similar congestion.

Microscopic Appearances.—Section through cervical cord.—The grey matter of the anterior horns shows diffuse and intense infiltration, with some localised

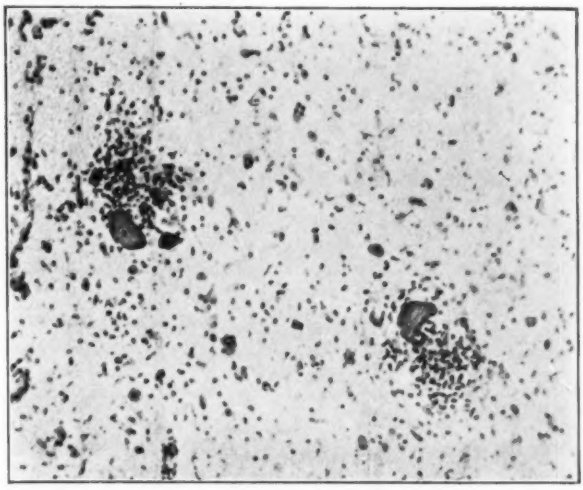

FIG. 5. Case 2. Junction of pons and midbrain. Highest level at which infiltration is seen. It occurs round the cells of the mesencephalic root of the fifth nerve and is the only evidence of inflammation at this level. The oculomotor nuclei are not involved.

collections of cells round nerve-cells. Perivascular infiltration with lymphocytes occurs, some polynuclear cells being present among them.

Section through the mid-pons.—A diffuse infiltration is present beneath the floor of the fourth ventricle with more intense infiltration around the nuclei. Laterally, the fifth nucleus is very definitely invaded and cell degeneration or absorbtion by neuronophagic cells is a marked feature. Perivascular infiltration is seen. The trapezium, pyramidal bundles and nuclei pontis are not involved (fig. 6).

PATHOLOGY.

Morbid Anatomy.—In the nervous system, the surfaces of the brain, cord and meninges appear normal, or slightly congested. In Case 1 there

was hæmorrhage over the anterior surface of the pons and medulla and over the whole circumference of the cord at a lower level. The hæmorrhage was under the pia mater and appeared to arise from a vessel on the anterior surface of the medulla. On section of the cord at the affected level, the grey matter of the anterior horns appeared hyperæmic. This stage is well illustrated in Case 3. Hypertrophy of lymphoid tissue was seen in Case 1 where there was definite enlargement of the mesenteric glands.

Histology.—The meninges are seen to be congested and are the site of a small round-celled infiltration. The hæmorrhage round the cord in Case 1

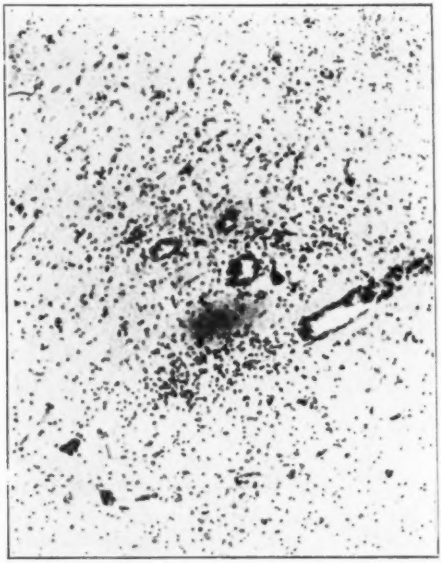

FIG. 6. Case 3. Pons shows diffuse and perivascular infiltration.

is probably due to the intensity of the congestion which has caused a rupture of small vessels.

The main histological changes are found in the grey matter of the bulb, and consist of a diffuse cellular infiltration with a localized collection about the vessels, and degeneration and phagocytosis of the nerve-cells. The infiltrating cells are mainly lymphocytes which are scattered diffusely through the grey matter, or are collected in groups around an effete nerve-cell. The localized perivascular infiltration is in the adventitial lymphatic spaces and gives rise to the histological appearance described as ' cuffing '

of the vessel. The cells are again mainly lymphocytes, but there are among these cells a number of polymorphonuclear cells. Many nerve-cells show chromatolysis due probably to the direct action of the virus and in some cases this degeneration has taken place before the appearance of perivascular cuffing. Some of these damaged cells are surrounded by groups of lymphocytes, some are invaded by the glial neuronophagic cells, and others entirely replaced by them. Small hæmorrhages with areas of degeneration are visible in the grey matter.

In Case 2 it will be seen that a number of the cranial nerve nuclei are involved, but there is practically no spread outside the grey matter. In spite of the extent of the lesions in the pontine and bulbar nuclei, the pyramidal tracts have escaped. It is of interest to note that in the highest section in Case 2, viz., through the junction of pons and midbrain, the only area involved is that of the mesencephalic root of the fifth nerve.

DISCUSSION.

This histological picture and account of the morbid anatomy are in agreement with the accepted pathology of poliomyelitis as established by Harbitz and Sheal (1907) and Wickman (1911). Much discussion has centred round the origin of the various cells in the lesions of poliomyelitis, but it is generally agreed that the infiltrating cells are mainly microglia and lymphocytes, though a number of polynuclear cells are also present in the perivascular infiltration. Plasma and plasmoid cells are seen but rarely.

Infiltration is seen round the mesencephalic root of the fifth nerve in the section at the junction of the pons and midbrain in Case 2, but there is no infiltration or involvement of the fourth nucleus, or any other nucleus or tract at this level. This fact supports the evidence of Fairbrother and Hurst (1930), that the spread of the virus is by the axis-cylinders. Goodpasture (1925) had shown previously that infiltration appeared round the nucleus of the fifth nerve after the virus was injected into the cheek.

Although the virus almost certainly spreads by the axis-cylinders of the pyramidal tracts to the anterior horn-cells no infiltration of the pyramidal tracts is seen, indicating that this tissue has no affinity for the virus. The reaction of the virus and tissue where such affinity exists probably originates some metabolic or chemical change which produces chemiotaxis of wandering cells and in this way the infiltration.

The histology of the brain-stem type of poliomyelitis is shown in this paper to be similar to that of the spinal form, and the microphotographs indicate that the bulbar lesions may be quite as intense as those in the spinal cord. This histological picture can be distinguished from that of epidemic

encephalitis, and the more recently described meningo-encephalo-myelitis following the specific fevers or vaccination. In epidemic encephalitis, the lesions are seen mainly in the basal ganglia and midbrain, less in the medulla and cord. The meninges are scarcely involved. The intense and often wide ring of ' cuffing ' is most characteristic, though polymorphonuclear cells and the diffuse infiltration of poliomyelitis are absent. Neuronophagia is rare. In meningo-encephalo-myelitis the white matter of the brain is more affected than the grey matter, whereas in the cord both are equally affected. The meninges escape involvement. The lesions are perivascular but they extend outside the sheath, giving rise to a characteristic zone of well-marked demyelination of nerve fibres.

McIntosh and Scarff (1928) state that in poliomyelitis lesions are mainly found in the grey matter of the cord, while changes in the brain are very rare and relatively slight. Undoubtedly every part of the central nervous system may be affected; lesions have been found in the cortex, midbrain, basal nuclei and peripheral nerves, as well as in the brain-stem and cord; but on searching for cases of ' cerebral ' poliomyelitis one is struck by the increasing scarcity of these cases since 1918, when encephalitis lethargica was first described by von Economo. Ayer (1928) does not consider an encephalitic form, and Silverman (1929) says that, among 266 cases, one case only was suggestive of the cerebral or encephalitic type and that the evidence was by no means convincing. Experimental work shows that even when the active virus is inoculated into the occipito-parietal lobe of a monkey, it is almost invariably the opposite lumbar cord that is first affected and the local cerebral condition at any time is not very marked. Thus there is considerable doubt as to the existence of a cerebral or a cerebellar type as a distinct form of the disease.

It was thought that the virus spread by a meningeal route, but Hurst (1929) described the result of histological examination of serial sections of the brain in monkeys killed on each day from the first to the fifth, following intracerebral inoculation, and demonstrated an overflow of inflammatory cells from the deeper infiltrated vessels along the perivascular spaces to the meninges. A meningeal lesion therefore complicates a deeper lesion.

Hence, three of the groups in Wickman's classification exist only doubtfully, viz., the cerebral, cerebellar, and meningitic groups, and Batten (1916) disposes of yet another, the neuritic group.

As there appears to be ample justification for considering the bulbar group of cases as a definite type, the old classification should be replaced by the simple division of cases into spinal, bulbar and abortive.

SUMMARY.

1. A relationship between tonsillectomy and the onset of poliomyelitis is discussed, with its bearing on a probable incubation period.

2. Clinically the cases show a prodromal period with a raised temperature and pulse, pharyngitis and vomiting. This is followed by involvement of the cranial nerves, with resulting paralyses.

3. These fatal cases are proved to be poliomyelitis by pathological examination. Evidence is brought forward in favour of the theory of axon spread of the virus, and a simplified classification is adopted to accommodate recent histological and clinical views as to the site and type of lesions occurring in the central nervous system.

My thanks are due to Dr. Poynton, Dr. Ryle, Dr. Greenfield and Dr. Weston Hurst for permission to publish these cases.

PSEUDOSCLEROSIS OF STRÜMPELL-WESTPHAL IN FIVE MEMBERS OF A FAMILY.*

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INTRODUCTION.

In 1878 Strümpell[1] reported a case resembling multiple sclerosis in which he found abnormal hardness and consistency of the brain. He suggested several possible causes, including hypertrophy or atrophy of the brain, senility, alcoholism, saturnism, and acute or chronic inflammatory processes. In 1883, Westphal[2] reported two cases resembling multiple sclerosis, but the microscopic examinations of the brain and spinal cord were negative. These cases showed progressive dementia, which appeared early in the course of the disease, and were characterized by absence of nystagmus.

Between 1883 and 1905 fourteen cases were reported in the literature in which it was noted that the brain and cord were unusually firm. Potts and Spiller[3] reviewed these and concluded that one could not differentiate pseudosclerosis from disseminated sclerosis; they stated that the unusual firmness must be caused by a proliferation of the neuroglia even if it cannot be detected by a microscope. Hugo Weiss[4] described the disease as characterized by headaches, dizziness, fatigue, changes of mood, facile laughing and crying, transient double vision, speech disturbances and rhythmic spasmodic movements of the extremities. Rebezzi[5] thought that pseudosclerosis and multiple sclerosis were manifestations of the same disease-process and should be considered as one disease due to primary affection of the nervous elements with secondary increase of glia-cells. He proposed the name 'Westphal-Strümpell disease.' Oppenheim[6] in his text-book states it is difficult, if not impossible, to differentiate pseudosclerosis from disseminated sclerosis in life.

In 1902, Kayser[7] referred to the occurrence of peripheral annular pigment of each cornea in a patient with nervous symptoms similar to those of disseminated sclerosis. In each eye there existed an annular peripheral pigmentation of the cornea, which began at the limbus and gradually faded away centrally so that the central oval area of the cornea remained normal.

* Read before Bellevue Neurological Society, November, 1931. From the Neurological Service of Dr. Foster Kennedy, Bellevue Hospital, New York City.

The peripheral parts were made up of an accumulation of yellowish granules which became finer and more diffuse centrally, where the colour changed to a yellowish green. Fleischer[8] later worked with this same patient, who subsequently developed more nervous symptoms; eventually he developed glycosuria, and a greenish-brown pigmentation of the head and hands became evident with a greyish discolouration over his chest and abdomen. At autopsy the liver was seen to be small and nodular; the spleen was enlarged. There were no gross or microscopic signs of multiple sclerosis. The cornea showed pigmentation of Descemet's membrane, extending centrally for about 1·9 cm. The deposit consisted of rounded and angular greenish-brown granules that appeared refractile at a certain angle. This pigment was also found in the liver, spleen, intestines and kidneys. A chemical examination of some of the granules in kidney and spleen seemed to indicate the presence of silver, but certain other tests made this chemical diagnosis improbable[9]. There was no history of the patient having had silver administered, while in argyrosis mental symptoms rarely, if ever, occur.

In 1912 Wilson[10] described the disease known as progressive lenticular degeneration. He said it was a disease which occurred in young people, which is often familial, but not congenital or hereditary; it is essentially and chiefly a disease of the extrapyramidal motor system and is characterized by involuntary movements, usually of the nature of tremor, dysarthria, dysphagia, muscular weakness, spasticity and contractures with progressive emaciation; with these may be associated emotionalism and certain symptoms of a mental nature. It is progressive and after a longer or shorter time fatal. Pathologically it is characterized predominantly by bilateral degeneration of the lenticular nucleus and, in addition, cirrhosis of the liver is constantly found, the latter morbid condition rarely if ever giving rise to symptoms during the life of the patient.

In his paper, Wilson did not mention the corneal ring. Pollock[11] in 1917 reported a case of Wilson's disease with corneal pigmentation. Hall[12] in 1921 in a complete review of the literature states that the corneal ring is pathognomonic for the diagnosis of pseudosclerosis or of Wilson's disease. Of sixty-eight cases which he reviewed, the corneal ring was not mentioned in thirty-one. Of the remaining thirty-seven cases the ring was present in sixteen cases of pseudosclerosis and four cases of Wilson's disease and in one case of doubtful diagnosis. In five cases of Wilson's disease and eleven cases of doubtful diagnosis the ring was not present.

Hall reviewed the literature concerning the chemical nature of the pigment and was unable to settle the question. The possibility of its being some kind of an endogenous pigment—of the hæmoglobin group—which does not give the iron reaction, appears to be the most probable theory.

SYMPTOMATOLOGY.

Pseudosclerosis is frequently a familial disease affecting people usually between the ages of fourteen and twenty-six. It is a disease in which remissions frequently occur and itself may last fifteen to twenty years. The symptom-complex includes (*a*) neurological signs; (*b*) corneal pigmentation; (*c*) mental signs; and (*d*) cirrhosis of the liver.

(*a*) The neurological signs include:—

(1) Speech disturbances (the voice is slow, monotonous, indistinct, or staccato in type).

(2) The face is usually 'fixed,' with a tendency to grimacing.

(3) There is marked intention-tremor with some muscular rigidity, but rigidity is less marked than in Wilson's disease.

(4) Gait is of paretic-ataxic type.

(5) Cerebellar signs, as adiadokokinesis or dysmetria, occur.

(6) Exaggerated deep reflexes with retention of abdominals and plantar flexor responses are found.

(7) Occasional apoplectiform or epileptiform seizures[13] may occur.

There is no pallor of optic discs, no nystagmus, no loss of bladder control.

(*b*) The finding of annular greenish-brown corneal pigment is considered pathognomonic of either pseudosclerosis or Wilson's disease[14].

(*c*) Instead of showing euphoria, as is the usual finding in multiple sclerosis, the patients exhibit marked fluctuation in mood. They become irritable on the slightest pretext, and quarrel a great deal. At times they become maniacal, confused, or suicidal. They have frequent outbursts of crying, and are very untruthful. Mental deterioration is frequently found.

(*d*) The cirrhosis of the liver is usually asymptomatic, and is found only at autopsy. Occasionally during life the liver or spleen may be palpated or liver function tests may indicate liver damage.

PATHOLOGY.

Spielmeyer[15] believes that the same disease-process is common to both Wilson's disease and pseudosclerosis and that a differentiation on histopathologic grounds is not possible.

Wilson's disease is held to be a degenerative process of the corpus striatum, the cerebral cortex showing no noteworthy changes. Alzheimer finds in pseudosclerosis (Westphal-Strümpell) the principal lesions in corpus striatum, optic thalamus, subthalamic region, pons and dentate nucleus of the cerebellum, but lesions also occur in other parts of the brain and especially in the cerebral cortex. The essential pathological picture is

thought to be the occurrence of the giant glia-cells with large lobulated nuclei poor in chromatin, and scanty cytoplasm.

Uchimura[16] described a case in which the striatum and pallidum showed an increase in nuclei of a glial nature. These were of two types: (1) small cells filled with fat, and (2) typical large Alzheimer glia-cells. In the putamen there was perivascular infiltration with fat-laden cells. The most striking feature was the accumulation of such cells in the striatum. Similar changes were found in the external capsule, anterior commissure, and in the lowest portion of the internal capsule. The fatty degeneration was sharply localized.

Bielchowsky and Hallervorden[17] give the clinico-pathological report of two cases of pseudosclerosis which at autopsy showed symmetrical fusion of the lesions in the frontal lobe.

DIFFERENTIAL DIAGNOSIS.

Multiple Sclerosis.—Pseudosclerosis is differentiated from multiple sclerosis by the absence of optic disc pallor, absence of nystagmus, lack of involvement of the bladder, intact abdominal reflexes, negative Babinski sign, and the mental picture, which differs from the euphoria of disseminated sclerosis.

Juvenile Parkinsonism.—Many cases of pseudosclerosis including two of the cases to be reported here have been diagnosed as postencephalitic Parkinsonism. A masklike facies is seen in both conditions. The tremor in Parkinsonism is constant at rest, and ceases on voluntary effort, while in tremor of pseudosclerosis is of the intention-type. In Parkinsonism the liver is not involved nor is the corneal ring present.

Wilson's Disease.—Some writers, including Higier[18] and Rausch and Schilder[19], regard Wilson's disease as a special form of pseudosclerosis. Wilson, in Lewandowsky's *Handbuch*, states that some cases of pseudosclerosis seem to be nearly related to progressive lenticular degeneration. Stocker[20] believes the mental condition is sufficient to differentiate between the two. In Wilson's disease the mentality remains intact longer and the patient is usually euphoric; in pseudosclerosis early dementia occurs with characteristic mental signs of irritability, attacks of violent temper, etc.

In Wilson's disease both hypertonicity and intention-tremor are seen, while in pseudosclerosis the predominant symptom is thought to be the latter. No swallowing difficulties occur in pseudosclerosis. Dysarthria and dysphagia are frequent and early signs in Wilson's disease, eventually leading to cachexia. As a rule no cerebellar signs are found; there are few or no remissions, and the disease has a shorter course of three to nine years.

ETIOLOGY.

Westphal and Sioli[21] adduce evidence for the infective origin of pseudosclerosis. In their case the syndrome followed epidemic encephalitis.

Pathological examination showed cirrhosis of liver, Alzheimer glia-cells, proliferative changes in the vessels, and collections of small round cells. Campbell and Moore[22] report the case of a printer with erysipelas who developed mental symptoms with marked tremor of hands and head and difficulty in articulation. At autopsy cirrhosis of the liver and typical large glia-cells in cortex, basal ganglia and midbrain were found. In this case the first nervous symptoms (prolonged sleep) appeared with an attack of facial erysipelas; a second attack of erysipelas was associated with a period of stupor; the patient died during a fourth attack. In Simpson's[23] case the father and mother were cousins. In the cases to be reported here the father and mother were first cousins.

PROGNOSIS.

Remissions and exacerbations have been reported, and patients have been known to live for fifteen or twenty years. The prognosis is considered better than in Wilson's disease, which usually becomes progressively worse.

TREATMENT.

No specific therapy is known. Liver therapy has been suggested. Some writers propose the use of decholin, a cholic acid derivative ($C_{23}H_{33}O_3COOH$), giving 10 cc. of a 20 per cent. solution intravenously. Decholin is intended to increase the functional activity of the liver.

PERSONAL CASE REPORTS.

Of the five cases to be reported here, two patients are at present in neurological hospitals, a third is on parole from a state hospital, and the other two, although living at home and going to school, are having difficulties in adjusting satisfactorily in the community.

Family History.—The patients are of Russian Jewish descent. Familial mental and nervous diseases are denied. The paternal grandfather died at 68 of heart trouble. The paternal grandmother died at the age of 57 following a cerebral accident. The maternal grandfather died at 40 of typhus. The maternal grandmother is living and well at the age of 80.

The father and mother were first cousins. The former died at age of 37 of pemphigus (eight years ago); a paternal uncle and aunt are living and well. The mother, age 40 years, has marked emotional instability. Her speech is expressionless. There is a suggestion of a corneal ring in her left eye. Her physical and neurological examination is quite negative. Icteric index was three. Direct and indirect Van den Bergh tests were negative. A maternal uncle and two maternal aunts are living and well. Three maternal uncles died in childhood, one of measles, one of pneumonia and one of typhus.

The mother had seven children and three miscarriages.

Pregnancy 1.—A miscarriage at about six months following a fall down stairs.

Pregnancy 2.—A boy, H. W., age 21 years, who at present is on parole from a New York State Hospital, where his case has been diagnosed as psychosis with psychopathic personality. It had once been considered postencephalitic Parkinsonism.

This patient reached the third year of high school at the age of 15. At the age of 13 he fell off a truck, hit his head, and was unconscious for two hours; at the age of 16 he had what was diagnosed as chorea.

At the age of 18 there was noted a gradual slowing of all the patient's movements. His speech became thickened, indistinct and at times explosive. He became quite unstable emotionally, laughing loudly at times; he also developed marked irritability and would quarrel with his mother and sisters and frequently was very brutal to them. He was at a State Hospital for thirteen months where he was considered to be mentally deficient. Within the past few weeks he has had two or three epileptiform seizures.

Physical and Neurological Examination.—Patient is fairly well developed and nourished. He is of short stature, with marked vasomotor instability and thick spadelike hands. Heart and lungs are negative. Abdomen is normal. Liver and spleen cannot be palpated. Pupils are equal, regular, react to light and accommodation. The corneal ring of pigment is present bilaterally. There is no nystagmus. Facies is masklike. There is a doubtful right facial weakness. Speech is dysarthic and explosive. Other cranial nerves are negative.

He has a slow simian gait. When in the Romberg position he tends to fall backward. He has good power in all his limbs. There is a slight intention tremor of the left hand, and bilateral adiadokokinesis. He requires considerable time to perform simple tasks such as buttoning his clothes. Deep reflexes are active and equal. Plantar flexion responses occur bilaterally. Touch, pain, position and vibratory sensations are intact. There is no astereognosis.

Laboratory Findings.—Blood Wassermann, negative. Icteric index, 5. Van den Bergh (direct and indirect) negative. Liver tolerance test (intravenous injection of bromsulphalein) normal.

X-ray of the skull was not obtained as patient refused to enter the wards and to have any further examination done, apparently because his first epileptiform seizure occurred after a venous puncture for blood for the Wassermann reaction.

PREGNANCY 3.—A boy, B. W., died at the age of 8 days. This was a case of instrumental delivery.

PREGNANCY 4.—A girl, R. W., age 17 years, was admitted to the Psychiatric Ward at Bellevue Hospital on September 30, 1931. She was transferred from a neurological hospital where she was said to have been 'excited, unmanageable, profane, seeking the company of men, having emotional upsets of laughing and crying.' Her case had been diagnosed as one of chronic encephalitis.

She was admitted to the neurological service at Bellevue Hospital on October 15, 1931, at which time she complained of (1) tremor of the head and upper extremities of three years' duration; (2) difficulty in walking with a staggering gait of three years' duration; (3) thickened slow speech for three years; (4) double vision of one week's duration.

At the age of 7 she was jaundiced and was told she had an enlarged liver; at the age of 10 she had rheumatic fever. She had pneumonia and influenza at the age of 14. She reached the seventh grade of school at the age of 11. She had only one menstrual period which occurred at the age of 15.

Patient believes that all her neurological symptoms occurred after she had pneumonia and influenza three years ago.

Physical and Neurological Examination.—Patient is a fairly well developed and well nourished girl. Heart and lungs are negative. Abdomen is normal. Liver and spleen cannot be palpated. Fields and fundi are negative. The corneal ring is present bilaterally. There is no nystagmus. Pupils are slightly irregular and unequal, the left being larger than the right; both react

promptly to light and accommodation. Speech is slurring and monotonous. The gait is spastic, with a positive Romberg sign. Marked intention-tremor is present in both upper limbs; this can be easily demonstrated in the finger-finger and the finger-nose tests. Bilateral adiadokokinesia is present. The deep reflexes are hyperactive and equal; the abdominals are sluggish but can be elicited. Negative Babinski signs present. Sensation is normal.

While in the ward patient was irritable and quarrelled a great deal with her sister and with other patients; she constantly sought attention from physicians and nurses. She would lose her temper readily and then would cry in a very loud manner, disturbing the others.

A psychometric examination revealed that the patient had an intelligence quotient of 68 per cent. on the Stanford-Binet scale.

Laboratory Findings.—The urine showed a faint trace of albumen. No casts were present. Manometric examination showed an initial spinal fluid pressure of 90 mm. water pressure. No cells were seen in the spinal fluid. There was no globulin and no sugar. Colloidal gold curve: 0001100000. Blood and spinal Wassermann tests: negative.

Blood Picture.—Red blood count, 3,940,000; hæmoglobin 80 per cent. (Tolquist); white blood count, 8,050, with 58 per cent. polymorphonuclear leucocytes. Non-protein nitrogen, 30; blood sugar, 100, and creatinin, 1·0. Icteric index: 6·0. Van den Bergh tests (direct and indirect), negative. Basal metabolism test was −12 per cent. Liver function test showed an abnormal dye retention; at the end of two hours 15 per cent. of the dye was present in the blood stream. X-rays of skull and spine were negative.

Pregnancy 5.—A girl, D. W., age 15 years, was admitted to the neurological service at Bellevue Hospital on October 4, 1931, with the complaints of (1) tremor of both hands of two years' duration; (2) difficulty in talking for two years; (3) trouble in sleeping for two years; (4) double vision present occasionally during last two months; (5) occasional dizzy spells present during the past few months, usually associated with menstrual periods; (6) protruding anal mass present for a few weeks.

Patient's past history was essentially negative except for an injury to her right foot eight years ago, a piece of glass having infected her right heel. Since then she has been treated intermittently in several orthopædic hospitals, and skin grafts have been done. A resection of the posterior tibial branch of the nerve to the right heel was also performed. Alcoholic injections of the posterior tibial nerve were given but the pain in the heel has persisted.

For the past two years patient has noticed progressive weakness and an intention-tremor of her hands, accompanied by the other symptoms above mentioned. The mass protruding from the anus bleeds and is painful whenever patient defæcates.

Physical and Neurological Examination.—Patient is a rather poorly developed and nourished girl. Heart, lungs, and abdomen negative. Liver and spleen not palpable. Condylomata acuminata present. Right foot-drop present. Scars on abdomen on both sides present, said to be source of skin grafts. Cicatrix of right heel present, tender to touch. Right leg is shorter than the left.

Fields and fundi are normal. No nystagmus. Bilateral corneal ring present. Pupils are slightly irregular and unequal, the right being larger. Both react promptly to light and accommodation. Marked slurring of speech. Tremulous tongue. Patient drags right leg in walking. Positive Romberg sign. Marked intention-tremor of hands. Bilateral adiadokokinesia. Deep reflexes hyperactive but equal. Abdominals cannot be elicited. Bilateral plantar flexor responses.

Psychometric Tests.—Two years ago she had an intelligence quotient of 103 per cent. At the present time the I. Q. is 73 per cent. on the Stanford Binet Scale and 64 per cent. on the Army Performance Tests, while the psychologists report that the patient is very co-operative and that the findings are representative.

Laboratory Findings.—Urine, negative. Blood chemistry showed sugar, 98; creatinin, 1·3; and non-protein nitrogen, 35. Icteric index, 6·0. Van den Bergh tests (direct and indirect), negative. Blood Wassermann, negative. Manometric test showed an initial pressure of 80 mm. water with an open system. Spinal fluid showed no cells, globulin or sugar. Spinal Wassermann was negative and the colloidal gold curve was 0011000000. Liver function test showed no retention of the dye after two hours. The blood examination revealed a red blood count of 3,740,000, with 75 per cent. hæmoglobin; and a white blood count of 12,350 with 58 per cent. polymorphonuclear cells.

Basal metabolism was + 14 per cent., but examination was not considered satisfactory because of the restlessness of the patient.

X-ray of skull, dorsal, lumbar and sacral spine was negative.

The patient presented a marked problem in the ward because of her mental aberrations. She showed marked emotional instability, laughing or crying in a very loud manner on the slightest pretext. She quarrelled almost constantly with the other patients. She told lies constantly about the doctors, nurses and patients. She threatened suicide several times. She left the ward several times and was found in other parts of the hospital flirting with other patients. She made sexual advances to the various janitors and orderlies whom she encountered. She would often cry for hours at a time when reprimanded for her behaviour and would keep other patients awake at night.

It must be remembered that she was suffering some pain because of the condylomata which were being treated with deep X-ray therapy. However, a few tablets of placebo were sufficient to stop the crying spells even when she complained of considerable pain.

Her behaviour finally became such that it was necessary to transfer her to the psychopathic department.

PREGNANCIES 6 AND 7.—Twins—girls. The mother could not tell if the twins were identical; the delivery occurred at home without the aid of a physician. They were said to be so similar in appearance that until a year ago even the mother could not distinguish between them. At the present time the resemblance is not very noticeable.

(6) Y. W., age 13½ years, attends school. She has had to repeat two grades and now is in the 7B Grade. She is restless, quarrelsome, insolent. She has an intelligence quotient of 116 per cent. but has marked difficulty in adjustment in school.

The positive neurological findings here include the corneal ring bilaterally, a slow slurring speech and some adiadokokinesia.

This patient would permit no laboratory examinations. She made several appointments to see examiner but did not keep them.

(7) R. W., is in the eighth grade although she had an I. Q. of 110 per cent. She has had to repeat some of her school work. She, too, is irritable and restless.

The positive neurological findings here include the corneal ring bilaterally and a slight speech defect.

PREGNANCY 8.—A non-induced miscarriage at four months.

PREGNANCY 9.—A girl, F. W., age 11 years.

This patient is in the sixth grade at school; she is very quarrelsome, frequently runs away from home, and is entirely uncontrollable. When she visits her sisters she is restless, sarcastic, and quarrels constantly. She would permit no

physical or neurological examination except for an examination of her eyes. No corneal ring was present. Eye movements, pupils, etc. were normal.

PREGNANCY 10.—A miscarriage.

SUMMARY.

The literature regarding Westphal-Strümpell's pseudosclerosis is briefly summarized and the differential diagnosis between this condition and possible allied neurological conditions (especially multiple sclerosis, Wilson's disease, and juvenile Parkinsonism) is discussed. The Kayser-Fleischer corneal ring is mentioned as a pathognomonic sign of pseudosclerosis or Wilson's disease. Case-reports of five children in one family having this corneal ring with unusual neurological signs and mental symptoms are recorded. The parents of these children were first cousins.

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Short Notes and Clinical Cases.

A NOTE ON THE ACTION OF BULBOCAPNINE.

By

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The recent work of de Jong and Baruk on the experimental production of catatonia in animals by means of bulbocapnine throws light on the condition of catalepsy. The first important fact discovered is that bulbocapnine can produce effects in the higher animals corresponding to those of catalepsy in man, but cannot produce such effects in the lower vertebrates (frogs, snakes, lizards, fish), *which lack a neocortex*. Furthermore, as stated by de Jong and Baruk, in an animal whose cortex has been removed bulbocapnine does not cause catalepsy. This indicates that the catalepsy-producing effect of bulbocapnine occurs through a specific action of the drug on the cerebral cortex. In fowls, which have but a rudimentary neocortex, the catalepsy is incomplete and unstable. In moderate doses bulbocapnine has the unique effect of producing catalepsy. What is the physiological process at work here?

We must assume that in catalepsy there is primarily a blocking of sensory nerve-impulses in the central nervous system. That this is so is indicated by the fact that one may stick a pin into the flesh of a cataleptic person without any visible response. Generally speaking, to obtain a change of position of a limb or of the body in a cataleptic, *mechanical force* must be used, whereas in a normal person a nervous stimulus such as a pinprick or a slight pressure is sufficient. The long maintenance of one position by a cataleptic also suggests a complete isolation of the motor centres of the central nervous system from external stimuli.

In *sleep* there is also an isolation of the motor centres of the brain from external stimuli, but it is more of a partial isolation, for an individual may frequently move in his sleep from an obvious external cause. Also, the isolation of the motor centres in sleep is easily broken down by any slight stimulus which awakens the individual. The physiological process at work here is, according to Pavlov, a general inhibition of the cerebral cortex, descending to the subcortical motor centres.

Catalepsy, as well as sleep, is apparently caused by a change in the cerebral cortex, and in catalepsy that change would appear to consist of a

general cortical inhibition, but without descent to the subcortical centres, thus allowing the muscles to maintain contraction. In the catalepsy of human beings, the cortical inhibition differs further from that of sleep by being stable and persistent in character, thus more or less permanently shutting off the motor centres from external stimuli, but not causing them to enter into a state of inhibition such as occurs during sleep. It seems, therefore, that bulbocapnine *has a selective action on sensory elements of the brain*, thus isolating the animal from the external world (cf. ' l'animal perdre le contact avec le milieu extérieur '—de Jong and Baruk), and depriving it of ' l'initiative motrice.' Muscular action remains in the cataleptic, but it is static in character, the stimuli for dynamic muscular action having been cut off by the cortical inhibition. Mechanical force is therefore necessary to change the position of the cataleptic, and the opposition of the tonic contractile muscular action to the outside mechanical force gives us the ' negativism ' of catalepsy.

With smaller doses of bulbocapnine than those which cause catalepsy, de Jong and Baruk state that in the higher animals ' sleep ' is produced. However, the term ' sleep ' applied to the conditions observed is perhaps somewhat misleading, for it is applied to conditions where there does not appear to be inhibition of the lower motor centres—as judged by the animal's maintaining positions of muscular strain (cf. the ' Penseur de Rodin '), instead of reclining in a relaxed position as in ordinary sleep. The importance of this point is that if small doses of bulbocapnine did inhibit the subcortical motor centres, then why should larger doses leave these lower motor centres uninhibited, permitting the muscles to retain the tonic contraction of catalepsy? However, as the animals apparently do not ' go to sleep ' in the usual fashion with small doses of the drug, that is, do not recline with relaxed muscles, we may say that the action of bulbocapnine on these animals is confined to the cortex, which must be in a state of unstable inhibition, easily broken by the external stimulus that ' awakens ' the animal.

With larger doses of bulbocapnine than those which produce catalepsy the signs of *hyperkinesis* are observed, that is, movements of a stereotyped and mechanical character, or sudden violent movements, that may be equally suddenly arrested by a further state of catalepsy. If bulbocapnine is a drug which causes cortical inhibition, as appears probable, then the signs of hyperkinesis with large doses of the drug may also be due to inhibition—of other parts of the central nervous system. It is to be noted that in animals lacking a neocortex (fish and reptiles), signs of hyperkinesis—of rapid and mechanical-like movements—are caused by bulbocapnine (large doses). May it not be that in these lower animals bulbocapnine has a selective action on the sensory elements of the brain,

as in the higher animals? On account of the absence of a neocortex catalepsy is not produced. But why do we get the movements of hyperkinesis? Surely because the proprioceptive sensory impulses would be interfered with in a selective action of the drug on the sensory elements of such a brain. In the brain of the higher animals, a special organ, the neocortex, exists to deal in particular with stimuli from the external world. Proprioceptive stimuli can be dealt with by lower portions of the brain while the cortex is in a state of inhibition, as appears to be the case in catalepsy. In the lower animals, on the other hand, which lack a neocortex, all sensory impulses, including the proprioceptive, pass to a brain which cannot deal in a special area with impulses from external stimuli. Hence in such a brain a drug affecting these impulses from external stimuli would also be likely to affect the more closely intermingled proprioceptive impulses, thus throwing the muscular system out of equilibrium, and resulting in movement.

In the catalepsy of the higher animals, where only the cortex appears to be affected and proprioceptive impulses are not interfered with, a motionless state results, the muscular system not being thrown out of equilibrium. But when larger doses of the drug are given its effect extends to subcortical areas of the brain—still selecting the sensory elements, so that proprioceptive centres are interfered with, the subcortical motor centres no longer receive complete information, as it were, about the position of different parts of the body, and so exhibit disordered activity in purposeless, mechanical movements, or sudden violent efforts. This at least seems to be a possible interpretation of the action of bulbocapnine as suggested by the experimental work of de Jong and Baruk.

The fact that bulbocapnine in still larger doses causes convulsions (' epilepsy ') does not necessarily belie these conclusions, for many different kinds of drugs in large enough doses can produce convulsions, through a disorganisation of the nervous system and of the body generally.

A CASE OF RECURRENT OCULAR PARALYSIS.

By

R. EAGER, The Devon Mental Hospital, Exminster.

A case of recurrent paralysis affecting alternately the sixth and the third cranial nerves on the left side seems sufficiently uncommon to warrant publication.

I therefore give an account of the following case which has been under my care in The Devon Mental Hospital for a number of years.

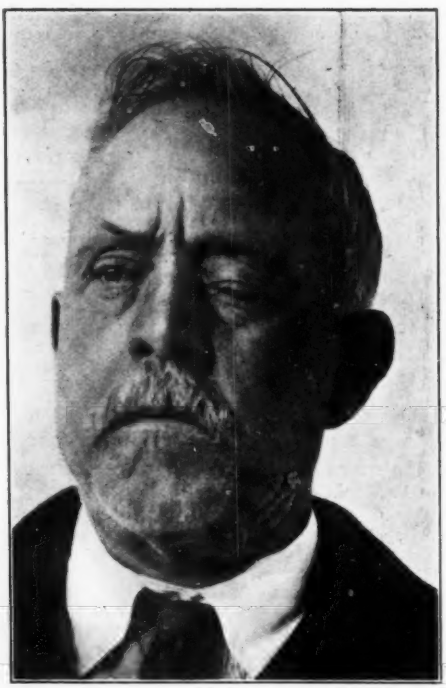

Fig. 1.

PERSONAL CASE.

W. M., a naval pensioner, aged 64, was admitted to hospital for a (third) mental breakdown in March, 1926. His first admission was in 1898 and his mental state since then had been one of manic-depressive psychosis. The reason given on his first admission was 'sunstroke' in India whilst serving in the navy.

No neurological signs or indications of any organic disease were found on the repeated examinations to which he has been subjected during his residence in hospital until August, 1929, when he developed a strabismus in the left eye. This had been preceded for some days by frontal headache which seemed worse over the left eye. There was no increased ocular tension; his blood was negative to the Wassermann test, and his urine was free of sugar.

Dr. G. P. D. Hawker, the visiting ophthalmic surgeon to the hospital, who examined him on this occasion, reported that he had a paralysis of the left external rectus; the eye did not move beyond the middle line, and when he fixed

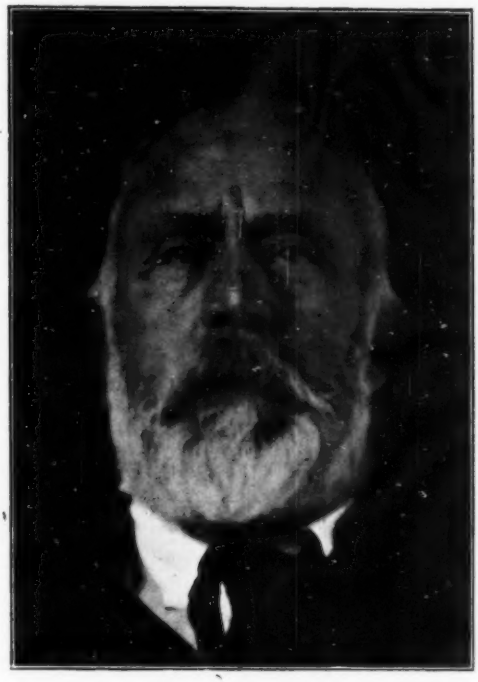

FIG. 2.

with the left eye it converged inwards. No obvious cause could be ascertained, and the condition cleared up in a few weeks without any active treatment.

The patient remained free of symptoms till July, 1931, when he again developed a strabismus together with a left-sided ptosis (fig. 1). This was again preceded by headaches and occasional nausea and vomiting for a few days. He again described the pain as in the forehead, but worse over the left eye, and the nausea as being mostly experienced when rising first thing in the morning.

On being examined again by Dr. Hawker he was found to have a paralysis of the left internal rectus, superior rectus and inferior rectus. The pupil was not dilated but reacted sluggishly on accommodation. Tested with the flutter test, no reaction in the visual fields could be demonstrated. There was no

proptosis and the discs were normal; a crossed diplopia was present, and the patient described the left image as being thrown over and across the other.

The eye movements, when tested, were as follows. When the left eye turned outwards the right eye turned upwards and inwards. When the right eye turned outward the left eye remained stationary in the mid-position. When the right eye turned up the left eye also remained in the mid-position, and when the right eye turned downwards there was only a slight attempt at a similar movement in the left eye.

There were no other signs of disturbance in the central nervous system. Tests for incoordination were negative and the deep and superficial reflexes were normal.

His blood pressure was not raised; the blood and spinal fluid were both negative to the Wassermann test; there were no symptoms of diabetes and the urine was free of sugar and albumen.

The patient was put on potassium iodide and mercury (pot. iod. grs. v, liq. hydrarg. perchlor. m. xxx, t. d. s.) which he took daily till the early part of October last. By that time the condition had cleared up except for some diplopia when directing the eyes upward, which subsequently also disappeared. His photograph after recovery from this second attack is reproduced in fig. 2, which is his present state.

DISCUSSION.

The interest in this case centres on causation. Here is a patient with a negative Wassermann reaction in blood and fluid in whom both the sixth and third cranial nerves have been involved consecutively, and yet both have become normal and left him unaffected.

What are the possible causes of this recurrent paralysis of the eye muscles? They seem to be: (1) a gumma at the base of the brain; (2) an orbital periostitis; (3) a cerebral tumour; (4) hæmorrhage into the nerve sheath or a degeneration or inflammation of the nerve fibres from some other cause; (5) rheumatism.

With regard to the first of these we have the Wassermann reaction giving a negative answer both in blood and fluid. I believe that syphilitic lesions do sometimes occur in which the Wassermann reaction may be negative, but when such is the case it must be wise to search for other possibilities.

Hence we come to the question of orbital periostitis. This again is usually regarded as of specific origin and is generally associated with considerable constitutional disturbances, of which there was no evidence in this case. Further, exostosis would almost certainly produce an exophthalmos, which was similarly absent. The nearest proximity of the sixth to the third nerve is in its passage through the sphenoidal fissure; an exostosis or periostitis here might therefore involve both nerves.

The third possibility I have suggested is cerebral tumour; but although there was a history of vomiting in the second attack this was preceded very definitely by nausea and was not of the type usually associated with cerebral tumour. There was no giddiness; no papillœdema has developed and the discs are normal.

With regard to the possibility of any local disturbance in the nerve sheaths, I find that Oppenheim in his *Text Book of Nervous Disease* (Vol. 1, p. 472) makes reference to cases of recurrent nerve paralysis which have been previously observed. He states that children are usually affected; that the paralysis is almost always preceded by frontal headaches and pain in the brow on the corresponding side, and often also by nausea and vomiting. The paralysis usually affects the whole nerve, although it may be occasionally restricted to some of its branches; it may completely disappear, again to become complete in subsequent attacks. On the other hand it may only partially disappear.

The causation seems to be a matter of dispute. Some regard it as a nuclear condition, while the majority regard it as a basal affection. Cases so far examined post-mortem appear to be limited to three. One of these showed a plastic exudate on the nerve trunk, and the others a new growth of the nature of a fibroma or fibrochondroma.

Swanzey in his *Handbook of Diseases of the Eye* refers to the same three cases as Oppenheim. Norris and Oliver, in Vol. IV of their *System of Diseases of the Eye*, also referring to them, aptly remark that whereas the post-mortem findings may have demonstrated the cause, it does not explain the intermissions.

Others have suggested that there may be a compression of the nerve due to a vasomotor disturbance. It might also be argued that this vasomotor disturbance, causing a distension of the vessels within the nerve itself, would favour an exudative process and new-formation in the nerve, especially fibrous tissue. Frankl-Hochwart (Obersteiner's *Textbook*, 1907) found post-mortem a ' neuritis ' of the third nerve which he attributed to arteriosclerosis of the basal arteries, but his presumably was not a recurrent case. All the above suggestions appear to be possibilities in this case.

Others (Lasanberger) have suggested a periodic swelling of the cavernous sinus as the cause. Thrombosis of the cavernous sinus has also been found, but this usually spreads to the other side and affects both nerves.

A nuclear lesion usually produces bilateral paralysis of the sphincter muscles of the pupil and of the ciliary muscles, which was absent from my case.

Oculomotor paralysis is said to occur as an initial symptom in general paralysis. In my 25 years' experience I have never seen this.

Lastly, rheumatism is looked upon as a cause of these recurrent cranial nerve palsies and might conceivably be so in this case. One is rather driven to this conclusion by the fact that no other cause can be ascertained; yet 'rheumatism' to most neurologists must appear much as neurasthenia or hysteria does to most of the rest of the profession—a 'dumping-ground' for any state that is not properly understood. I do not think that the history of 'sun-stroke' in India can have any connection with this case after so many years' interval, while the negative Wassermann reaction in both blood and fluid speaks against a syphilitic cause. While it is difficult to believe that the condition may not be syphilitic in nature it is equally difficult to accredit the cure to the iodide and mercury, seeing that on the first occasion the condition cleared up spontaneously without these drugs.

Editorial.

THE MENOPAUSE AND MENTAL DISORDER.

IN the classification of a passing psychiatry epochal forms of insanity were always described, and even now there is a greater belief in some of them than is scientifically warranted. That old age, with its degenerative organic changes, may be specially liable to be accompanied by psychotic symptoms is, of course, undisputed. That adolescence is a dangerous period from both a psychological and physiological point of view will also be universally agreed, though that dementia præcox may appear at a much later age is now fully recognised. The grouping of psychoses intimately in relation to pregnancy, lactation, or the puerperium has now been discarded with some reluctance, but the conception that the menopause has a distinct pathogenic influence is widely held not only by the laity but also by the medical profession itself. The 'change of life' is presumed to explain any nervous or mental abnormality, be it trivial or severe, that may happen to evince itself at or about this period. A comparatively modern text-book dealing with mental disease tells us that the suspension of the functions of the ovaries at the time of the climacteric, which occurs gradually between the ages of forty-five and fifty, produces various nervous symptoms in every woman and has peculiar mental concomitants. The writer further states that the sufferer is aware of an insidious change in her nature, has depression of spirits, occasionally weeps, and often becomes suspicious. There are other psychiatrists who speak of the three great crises of life, referring to adolescence, the climacteric, and the 'grand climacteric' or senility. The menopause undoubtedly involves endocrine and general metabolic modifications which may possibly have their psychic reverberations, yet at the same time have we any valid reasons for connecting this stage with a special tendency to mental disorder, or for speaking of

climacteric insanity? An examination of clinical facts would tend rather to answer these questions in the negative and to reveal evidence that such conceptions have arisen through lack of psychiatric discrimination and of insight into the real relationship of cause and effect.

We find that though psychiatrists differ to some extent as to what period of woman's life is associated with the greatest proneness to mental disturbance, careful statistics demonstrate the fact that the decade between the ages of forty and fifty shows no increased prevalence of psychosis. A reliable recent authority states that in women the highest incidence is found earlier, i.e., from twenty-five to thirty years of age. According to William White, the chart illustrating the female rate of depressive psychoses shows that after the age of forty there is a commencing steady decline in the incidence curve. No available data exist concerning psychoneurotic disorders, but it seems probable that even if it were noted that these showed some increase at this epoch, there are possible factors which would go to demonstrate that this is more apparent than real. Loose reasoning and ignorance of mental pathology have had much to do with the more or less blind acceptation of etiological relations which later knowledge has shown to be erroneous. We have only to recall how masturbation, sexual excess, syphilis, and alcohol were at one time thought to be important and all sufficiently causative of most psychotic troubles.

The climacteric factors would seem to come into a similar category. There seems no reason why natural physiological functions and change should per se be productive of morbid mental symptoms. The period of menstruation in women has been looked upon in an exaggerated way as provocative of psychic disturbance, and the same may be said of the menopause. A time-worn tradition exists that the 'change of life' necessarily involves an upsetting of body and mind. Not only is this fixed idea entertained by the public at large but the bulk of the medical profession are just as apt to attribute any vague deviation from health at this time to such an origin. Since the internal secretions and their functioning have become popularized, though our knowledge of their effects on the organism is in many respects problematical, it is far too readily assumed that some imbalance in this sphere is amply sufficient to account for the symptoms manifested. We agree

with Henderson and Gillespie when they remark that ' mental disease being as yet very imperfectly understood, and its causation more often than not a matter of surmise, it is not surprising that the endocrines should have become implicated as the principal malefactors. It is another example of the practice of despair in the theory of mental medicine, in which always in something other than disorders of mental function the cause of mental illness is sought.' It is certainly a fact that the great majority of women do not develop any abnormal mental reactions at the menopause. We have no scientific grounds for being in a position to correlate the biological and physiological changes that then take place with any mental phenomena that may appear. Those psychiatrists who lean towards a physicogenic point of view would doubtless connect these factors as intimately related, though any pathological theory would necessarily be vague and unsatisfactory. The analytical psychopathologist notes many psychological factors which he would regard as important exciting or contributing causes of a menopausal breakdown. At this age the emotional state of woman is liable to endogenous disturbing influences. For some time she may have been anticipating the advance of years, and all that it involves, with some trepidation and anxiety. With the cessation of menstruation she may feel that her sex life will be a closed chapter to her and that no longer can she propagate. that with the advent of grey hair and other signs of becoming elderly her attractions are on the wane. Her children have probably left the parental home, and unless she has wide external interests there will be a tendency to subjectivity and introspection. All of these factors are favourable to mental regression and may prepare a soil for some morbid superstructure. It is not surprising, therefore, that we find that the psychoses arising at the menopause are predominantly of a depressive nature. Nevertheless there are no distinctive characteristics about them to warrant our delimiting them from other depressed states which are by no means infrequent as the presenile period is approached. Such depressions may be psychoneurotic, may present the typical features of the manic-depressive, may be involutional in type, or be exaggerated emotional reactions to environmental conditions. It is possible also that their foundation may lie in premature pathological organic lesions associated with arteriosclerosis or senile changes. Infrequently other psychotic reactions such as

paranoid trends may present themselves, but nevertheless on analysis it is evident that we cannot scientifically classify any psychosis as belonging more especially to the menopause.

At this period there is likely to be a lessening of inhibitions, so that any constitutional trends, previously in abeyance, may find their way to the surface and present themselves now in a more exaggerated form. A longitudinal survey of the life-history of the individual will often reveal previous phases, and demonstrate that the age-period was only a releasing factor. It seems that we shall not be far wrong in stating that a definite psychopathic disturbance is only likely to manifest itself at the menopause when there exists a marked morbid soil, be it hereditary or acquired, which is ill-adapted to stand any strain or stress whether these take their origin in the domain of body or of mind.

A dispassionate study of this stage of life in woman in relation to mental disorder will, we think, bring us to the conclusion that it is a period in which nervous and mental equilibrium is put to the test, and whether she breaks down or not is a question of the relative values of the inherent stability of the organism and the adverse influences that beset it. That emotional instability is a common characteristic of the so-called critical age no one will gainsay, but the vast majority of the sex do not manifest any further symptoms.

It must also be noted that notwithstanding any tendency to any imbalance, mental disorder does not arise in the main from physiological causes of which we know little or nothing, but from physchological causes which as a rule are not difficult to demonstrate. It is probable, too, that, in the absence of psychic elements, organic factors intimately related to presenile changes play their part. Assuredly such a conception as ' climacteric insanity ' has no scientific validity if by that term we mean to indicate a nosological entity.

Abstracts.

Neurology.

NEURO-ANATOMY AND NEUROPHYSIOLOGY.

[148] **Myelin-containing ganglion-cells** (Über markhaltige Ganglienzellen).—F. T. Munzer. *Zeits. f. mikr.-anatom. Forschung*, 1931, xxiv, 286.

The author has made a painstaking study of a somewhat neglected subject in neurohistology, viz., the occurrence of myelin as a complete or incomplete sheath round nerve-cells and its collection in polar fashion within certain others. His paper is concerned also with the nature of those cells that sometimes are found to encapsule ganglion-cells. Myelinated nerve-cells are found chiefly in the ganglia of the cranial nerves, are common in reptiles and birds, rare in the lower mammals, and particularly so in man. The relation of the structures investigated to the neurilemma and its cells is also discussed. There are good illustrations and a full resumé of the pertinent literature.

J. V.

[149] **The development of the cortex and the functions of its layers.**—C. U. Ariëns Kappers. *Jour. of Ment. Sci.*, 1931, lxxvii, 692.

Summarizing his findings this writer states that the primitive arrangement of the cortex as it appears in the palæo- and archipallium shows two cell layers—the lamina granularis, which has mainly a receptive-correlative function, and the deep pyramids, which have a corticifugal and commissural efferent function. The principle of this lamination is kept up in the neocortex, with this difference, however, that the receptive-correlative granular layer has given rise to supragranular cells, which again are subdivided into two sublaminæ: the upper cells still retain a smaller size, while the cells lying nearer the granularis acquire a pyramidal form. As far as concerns the cause of the development of the supragranular layer, Kuhlenbeck, and later but independently of him, Faul, have given the following neurobiotactic explanation of this process, which is perfectly in accordance with the

facts. As in the palæocortex and in the archicortex the afferent cortical fibres, carrying corticipetal impulses, run in the zonal layer—a fact fundamentally represented by the primary and secondary olfactory tracts—similarly in the neocortex, callosal fibres and part of the ascending thalamic fibres run in the more superficial parts of the cortex, between the surface and the granular layer. Since therefore the space between the surface and the granular layer is an important region for corticipetal impulses, it is not strange that these impulses give rise to a much greater outgrowth of matrix cells of the granular layer in a superficial direction, and thus to the formation of supragranular layers which in maturing at the same time acquire a larger size.

C. S. R.

[150] **Anatomic variations of the cranial venous sinuses.**—E. A. Edwards. *Arch. of Neurol. and Psychiat.*, 1931, xxvi, 801.

Tobey and Ayer's modification of the Queckenstedt test has for its object the detection of thrombosis of the transverse or lateral sinus. Briefly, it depends on the fact that if the transverse sinus, forming the chief intracranial tributary of the internal jugular vein, is occluded, it will not act as an outflow for the cerebral circulation. Hence unilateral compression of the vein of the affected side will not produce an increased obstruction to the circulation, and consequently there will not be a rise in the spinal fluid pressure. The vein on the unaffected side has had to take over the entire outflow, and therefore its compression will cause a rise equal to that of bilateral compression in a normal person.

In a series of fifty skulls studied by the author 92 per cent. had a difference in the diameter of the outgoing venous sinuses of the two sides, twenty-five being larger on the right and twenty-one on the left. In the cases in which the sinuses were larger on the right, the variation in size was greater than when the left side was the larger. The greater resistance to flow caused by this increased the amount of blood carried by the right side in cases in which the right side was the larger, and tended to diminish the discrepancy when the left side was larger. There is therefore a definite anatomical basis for the fact that the mean of manometric tests shows more response to jugular compression on the right and less on the left. Individual variations occur so frequently, however, that the left side may carry much more blood than the right and may give much greater response to jugular compression.

R. M. S.

[151] **The effects of local freezing of the central nervous system of a cat**—A. SCHNEIDER and B. EPSTEIN. *Arch. of Neurol. and Psychiat.*, 1931, XXV, 1263.

IN connection with his work on experimental convulsions, Speransky, in 1926, reported a method of producing epileptiform fits in dogs by freezing portions of the cerebral cortex. The phenomena described were explained by Speransky on the hypothesis of the formation in the frozen area of an 'auto-neurotoxin,' which is disseminated throughout the the central nervous system and body by the spinal fluid and blood. The influence of the spinal fluid was apparently demonstrated by the fact that drainage of the fluid prior to the freezing caused a sharp delay in the reaction time. Furthermore, transfusions of spinal fluid from an animal in which the cortex had been frozen resulted in a similar, but again milder, set of symptoms.

The authors have repeated these interesting experiments on thirty cats. In none was there observed anything resembling the picture described by Speransky. In only one was any marked postoperative excitement noted: this soon disappeared and the cat recovered perfectly. The only clearly recognizable pathological condition consisted in a moderate degree of glial increase in the marginal and immediately subjacent layers of the cortex, with some evidence of the formation of gitter cells and slight neuronophagia. The dura appeared to exercise little if any protective influence in these cases. The paralyses produced by freezing of the spinal cord were transitory only, and this, together with the lack of objective changes in the cells of the spinal cord, shows conclusively that little if any lasting damage is done by the freezing.

The authors suggest that possibly the changes observed are due primarily to the temporary anæmia and anoxæmia produced by the stoppage of circulation during freezing.

R. M. S.

[152] **Pain pathways in the sympathetic nervous system.**—W. J. MIXTER and J. C. WHITE. *Arch. of Neurol. and Psychiat.*, 1931, XXV, 986.

A SERIES of thirty-one cases is reported in which the severest types of pain were relieved by interruption of the dorsal sympathetic fibres. The evidence so obtained, together with that gained from diagnostic block with procaine hydrochloride and injection of alcohol, has led the authors to believe that there may be definite sensory pathways running in the dorsal sympathetic chain.

R. M. S.

NEUROPATHOLOGY.

[153] **Modifications of the histological picture of the corpus striatum in persons dead of various diseases** (Modificazioni del quadro istologico del corpo striato in soggetti morti di malattie varie).—C. Berlucchi. *Riv. di pat. nerv. e ment.*, 1931, xxxviii, 152.

Dr. Berlucchi has performed a most useful task in making a long and detailed histological examination of the cell- and fibre-changes of the corpus striatum in persons dying of a number of different diseases and at different ages. It is clearly impossible to assign pathological importance to cell-changes attributed to a particular disease-condition if in point of fact such changes are either incidental on the one hand, or non-specific on the other. The paper is full of interesting information in regard to these points, and merits attention, more especially in view of the tendency to assign all kinds of clinical syndromes to disease of the ganglion. Dr. Berlucchi proves how susceptible are striatal cells, both large and small, to all sorts of general disease-states, and how they vary in their reactions from individual to individual; he demonstrates the occurrence of satellitosis in subjects who have succumbed to non-nervous diseases, and stresses the non-pathogenic significance of pigment and other abnormal colourable substances found in the ganglion under similar circumstances. For example, he shows how pigment considered by some characteristic of paralysis agitans is present in persons dying of some totally different affection.

There is much here of importance; the general conclusion imposes itself, that correlation of clinical and pathological findings must be undertaken with particular caution and circumspection where the corpus striatum is concerned.

S. A. K. W.

[154] **Anatomico-pathological observations on ependymitis** (Osservazioni anatomo-patologiche sulle ependimiti).—P. Redaelli. *Riv. di pat. nerv. e ment.*, 1930, xxxvi, 100.

The author from an abundance of human and experimental material has compiled a series of observations on the anatomico-pathological alterations of an inflammatory nature of the lining of the cerebral ventricles. He has studied inflammation of the ependyma in acute non-specific infections such as those which accompany acute meningitis and meningoencephalitis. A new light has been thrown on the study of acute and chronic tubercular lesions. The mechanism of origin of ependymal tuberculosis is clarified and two particular sources of infection have been distinguished: (1) a direct way by the exposure of the ventricular surface to infecting material, and (2) the

vascular, viz., perivascular propagation of the virus along the cerebral vessels coming from the meninges or from a circumscribed focus in the nervous system. The author describes the pathological picture of acute and subacute ependymal inflammation in actinomycosis, studied with experimental material. He points out the necessity of distinguishing between inflammation of the ependyma and disease of the ependyma. The first comprises the acute or chronic forms which always show a histological picture of inflammation; the second includes those forms which do not show inflammatory nature and structure, but which are due to dystrophic factors, to vascular sclerosis, to chronic mechanical or chemical irritations. They may, however, also be the ultimate result of inflammation of the ependyma, e.g., the diseased ependyma of chronic internal hydrocephalus, congenital or acquired, the diseased ependyma of old age whether of the common granular or of the reticulated form, and hypertrophic, nodal, and varioliform conditions.

R. G. G.

[155] **Research on the spirochætes in the brain of paretics** (Ricerche sulle spirochete nel cervello dei paralitici).—C. Rizzo. *Riv. di pat. nerv. e ment.*, 1931, xxxvii, 797.

Numerous well reproduced microphotographs show the distribution of the spirochætes through the different strata of the cerebral cortex in relation to the vessels, the neurones and the neuroglia.

R. G. G.

[156] **The sero-diagnosis of syphilis in mental hospital practice.**—J. Ernest Nicole and E. J. Fitzgerald. *Jour. of Ment. Sci.*, 1932, lxxviii, 96.

The micro-M.K.R. (Meinicke clarification reaction) has been done on 1,350 cases, 175 of these being selected for comparison with other tests, these others being the macro-M.K.R., the original Sachs-Georgi, the Burroughs Wellcome Sachs-Georgi, the Sachs-Witebsky and the Wassermann, performed on an average five at a time on each serum. Cerebrospinal fluid was tested in 170 of these cases by means of an average of four of these reactions and also by six usual chemical tests. The cases included 53 non-syphilitics, 38 syphilitics (not general paralytics), of which 17 had been treated, 26 general paralytics before treatment and 58 paralytics after malaria. Disagreements between these tests occurred (in blood) in 36 cases, of which four were non-syphilitics, 5 untreated syphilitics, and 27 treated (including general paralysis). Noteworthy points were:—(*a*) the micro-

M.K.R. and the macro-M.K.R. were only once wrongly negative; (*b*) the Sachs-Witebsky was never wrongly positive, and was more sensitive than the original Sachs-Georgi, but not than the Wassermann; (*c*) the B.W. Sachs-Georgi was the most unsatisfactory and gave most ' doubtfuls,' whilst the macro-M.K.R. and Sachs-Witebsky gave least; (*d*) the M.K.R. reactions were superior to all others in sensitivity. A routine procedure is suggested, consisting of applying a micro-M.K.R. to all admissions, and testing the positives by means of a macro-M.K.R. By this means a correct diagnosis is likely to be arrived at in at least 99·7 per cent. of cases.

C. S. R.

SENSORIMOTOR NEUROLOGY.

[157] **The syndrome of tumours involving the apex of the pyramid of the temporal bone** (La sindrome dei tumori dell'apice della piramide temporale).—G. Giraudi. *Rivista oto-neuro-oftalmol.*, 1931, viii, 1.

In this communication an endeavour is made to differentiate a syndrome for growths implicating the apex of the temporal bone. These tumours, generally malignant, come from the nasopharynx or are metastases of distant carcinoma, or may spread from middle or posterior fossa. The clinical syndrome combines three sets of symptoms, viz., auricular, trigeminal, and that of the abducens. In the ear are ' otitic ' symptoms produced by stasis; the trigeminal group comprises involvement of motion and sensation in the region of the fifth, Arnold's nerve, and sometimes the n. petrosus superficialis major. A comparison of the syndrome with others derived from lesions in the vicinity of other structures and foramina near the temporal apex follows.

S. A. K. W.

[158] **Report on 57 undiagnosed brain tumours** (Bericht über 57 nichtdiagnostizierte Hirntumoren, zugleich ein Beitrag zur Symptomatologie der Hirntumoren im Senium).—B. Badt. *Zeits. f. d. g. Neurol. u. Psychiat.*, 1932, cxxxviii, 610.

Between the years 1920-1930 an unsuspected or undiagnosed brain tumour was discovered 57 times in 2,054 autopsies on the head at the Hufeland hospital. For these cases, the diagnosis had been arteriosclerotic softening in 33, cerebral syphilis in 12, disseminated sclerosis in 4, and others in still smaller numbers. The causes for the mistakes in diagnosis were various, among which may be noted sudden onset of symptoms as with a stroke, the old age of some of the patients, a course identical with that of

encephalomalacia, absence of papillœdema (35 out of the total), fixed pupils (this is a curious point, which is fully discussed), absence or minimal quality of headache and vomiting, and so forth. The findings in the spinal fluid often misled also. The paper is well worth reading in its entirety.

S. A. K. W.

[159] **Crossed aphasia** (Afasie crociate).—L. DE LISI. *Riv. di pat. nerv. e ment.*, 1930, xxxvi, 200.

A CRITICAL review of the question of crossed aphasia in left-handed persons is given. The literature is confused on the question of lesions in the right hemisphere being productive of aphasia in left-handed people. In the author's own case of left hemiplegia with aphasia, large areas of softening were found which certainly involved the 'speech centre'; but although nothing was discovered macroscopically in the left hemisphere, when microscopic examination was undertaken an area of œdema was found in the 'speech centres' of that hemisphere. This finding seems to make the question of crossed aphasia doubtful.

R. G. G.

[160] **Arachnoiditis adhæsiva circumscripta** (Über Arachnoiditis adhæsiva circumscripta).—B. BROUWER. *Ducts. Zeits. f. Nervenheilk.*, 1931, cxvii, 38.

THE vexed question of serous meningitis, of circumscribed serofibrous meningitis and of adhesive arachnitis, is discussed in detail by Professor Brouwer on the basis of personally observed examples. He believes the spinal form of circumscribed arachnoiditis is commoner than is generally supposed. Its differential diagnosis from extramedullary tumour still remains curiously difficult. If the affection is preceded by some acute infective condition diagnosis is perhaps less troublesome. Spinal tumours may vary in their course, as does arachnoiditis; further, they may well be accompanied by arachnoid collections of fluid.

S. A. K. W.

[161] **Adhesion headache as a sequel to meningitis serosa adhæsive circumscripta** (Der Adhäsionskopfschmerz als Folge der Meningitis serosa adhæsiva circumscripta).—F. H. LEWY. *Zeits. f. klin. Med.*, 1931, cxvi, 36.

A CERTAIN number of cases of headache and giddiness, often dismissed as 'neurasthenic,' have objective neurological signs. The syndrome here discussed includes (1) local symptoms referable to either frontal lobe or

cerebellum, (2) absence of signs of raised intracranial pressure, except lassitude and sickness, and even a lowered diastolic pressure in the central artery of the retina, (3) reduced protein content of the spinal fluid, (4) a characteristic vestibular finding in the form of unilateral hypertonus of ocular muscles with caloric stimulation, and (5) limited collection of air over the cortical surface shown by encephalography.

The author considers that this syndrome can be found after any severe infection with cerebral symptoms, in typhoid and typhus, influenza, and in particular as a vicinity syndrome in affections of ear or nasal sinuses. Pathologically, its origin is an arachnitis adhæsiva circumscripta. Relief is often obtained by injection of 60-80 c.cm. of air.

Fine encephalograms illustrate the paper.

S. A. K. W.

[162] **Hepato-lenticular degeneration** (Über die hepato-lentikuläre Degeneration).—F. Luthy. *Deuts. Zeits. f. Nervenheilk.*, 1931, cxxiii, 101.

Dr. Luthy has written a very carefully compiled study of the disease, based on two personal cases, and remarkably complete in its analysis of more than one hundred found in the literature. The numerous problems of the affection are discussed judicially, and much valuable information is collected for the purposes of reference. The sections dealing with pigment-formation, with the relation of the liver changes to the disease, and with pathogenesis, are instructive, even if there are many lacunæ in knowledge still to be filled.

S. A. K. W.

[163] **On the connexions between striatum and liver** (Über die Zusammenhänge zwischen Striatum und Leber).—H. Lœvy. *Der Nervenarzt*, 1931, iv, 653.

'Kernicterus,' paralysis agitans, and Parkinsonism are not calculated to throw any light on the interrelation of liver and brain disorder. In respect of Wilson's disease and pseudosclerosis the author considers it is not absolutely certain that hepatic disturbance precedes the other; both possibilities have been recorded. The two may therefore not be causally connected, but merely occur in combination. In view of the familial incidence of these affections, the suggestion is made that hereditary factors account for each of the main symptom-groups. A long bibliography accompanies the article.

S. A. K. W.

[164] **The localisation and pathophysiology of choreic movement** (Zur Lokalisation und Pathophysiologie der choreatischen Bewegung).—F. E. POSTHUMUS MEYJES. *Zeits. f. d. g. Neurol. u. Psychiat.*, 1931, cxxxiii, 1.

A LONG article on a much-discussed problem does not contain any outstanding novelty. It deals adequately with the appropriate literature and incorporates concise description of two cases of senile chorea with autopsy. Dr. Meyjes is content to adopt a non-committal attitude, affirming that there is much evidence for a cortical component in chorea, but also for an extrapyramidal component; the two may work together. He considers it is not yet fully proved that the efferent path for choreic movement is the corticospinal.

S. A. K. W.

[165] **The myoclonias of the electric chorea of Henoch-Bergeron** (Sur les myoclonies de la chorée électrique d'Henoch-Bergeron).—L. VAN BOGÆRT and J. SWEERTS. *Revue neurol.*, 1931, i, 262.

THE authors describe a case which they put into the category of so-called electric chorea. It was that of a little boy of eight, who from the age of five suffered from brief and abrupt little choreiform movements, at first confined to the right arm. Analysis of the symptoms leads the authors to distinguish three types of movement: (1) choreiform movements, chiefly of face, mouth and tongue, but also of the extremities—all rather slow, irregular, and ' creeping ' in character; (2) clonic twitches, seizing the whole body and endangering balance, producing displacements and usually accompanied by normal synergies; (3) myoclonic twitches, as abrupt as electric discharges, confined to one muscle or part of a muscle. Those of the second category were influenced by volition, those of the third were not.

J. S. P.

[166] **The neural paths for the secretion of tears and their disorders** (Über die nervosen Bahnen der Tränenabsonderung und deren Störungen).—A. LUTZ. *Archiv f. Ophthalmol.*, 1931, cxxvi, 304.

A COMPREHENSIVE review of the subject of tear secretion and its derangement. The path for the purpose runs in the seventh nerve, and the secretory centre of pontine level can be influenced in a variety of ways, which are fully described. There are many references to the literature.

A. B.

[167] **The origin of Sluder's or spheno-palatine neuralgia.**—L. P. Cox. *Med. Jour. of Australia*, 1931, xviii, 435.

When the sphenoidal sinus is infected the structures which may be implicated thereby include (1) the optic nerve, (2) the pterygoid canal with the Vidian nerve within, (3) the cavernous sinus and various ocular nerves, (4) the spheno-palatine ganglion. The syndrome of sphenoidal empyema comprises pain in and about the eye, extending down over the cheek to the upper teeth, and back into the temporal region. Operative treatment usually relieves the pain, but it may not—in which case Sluder's neuralgia persists over the whole or some part of the region typically affected. It differs from tic douloureux in being more constant, less stab-like; it is not influenced by eating, or by hot or cold fluids, nor are there any ' trigger points ' associated with it. It was termed by Sluder ' lower half headache.' According to him it is due to irritation of the spheno-palatine ganglion, which lies deeply in the spheno-maxillary fissure, and can be cured by alcoholic coagulation of the ganglion, through the nose, where it lies, rarely more than 4 mm. in depth, lateral to the large spheno-palatine foramen.

According to the writer, who gives a complete anatomical survey of the constitution of the ganglion, with its motor, sensory, and sympathetic roots, Sluder's neuralgia can be cured by the same measures that are employed for the treatment of ordinary major trigeminal neuralgia. He argues with much ingenuity, relying on the facts of comparative anatomy, that in the Gasserian ganglion is a special nerve-cell group which has to do with the naso-ciliary system (a system fused with the nerve of the first branchial cleft and one to which the spheno-palatine filaments of the second division of the fifth may be surmised to belong), and that this group is mainly in the median part of the Gasserian, i.e., the part largely associated with the ophthalmic nerve or first division.

Sluder's neuralgia appears to be an infective neuritis of the nerve-fibres supplying the mucous membrane of the nasal cavity and adjacent sinuses. These fibres seem to constitute a separate entity in the fifth nerve.

A. B.

[168] **Isolated unilateral paralysis of the jaw** (Isolierte einseitige Kaumuskellähmung—Monoplegia masticatoria—auf offenbar neuritischer Grundlage).—F. T. Munzer. *Münch. med. Woch.*, 1931, lxxviii, 1692.

Monoplegia masticatoria is a clinical rarity. The case described is that of a young man of 23 who, suffering from toothache, had a premolar extracted under gas. Three days later he developed a moderate fever, with pains in

the right side of the neck and slight difficulty in swallowing. A day or two later he had a feeling as if the right mandibular articulation had ' sprung out.' There were pains elsewhere in the body, with sore throat; the blood was negative for organisms, and a monocytosis of 11 per cent. was found. On examination the left masseter and left temporalis were seen to be completely paralysed, without any other cranial nerve involvement—in particular, none of the sensory fifth.

The case is regarded as one of neuritis affecting solely the motor fifth on the left side, comparable to those of sciatic neuritis in which the symptoms are purely motor. The literature is carefully recorded.

J. V.

[169] **A peculiar affection resembling disseminated sclerosis** (Sur une affection particulière simulant, au point de vue clinique, la sclérose en plaques et ayant pour substratum des plaques spéciales du type senile).—G. Marinesco. *Arch. Roum. de pathol. expériment.*, 1931, iv, 41.

The patient was a man of 46 whose symptoms commenced nine years prior to his coming under observation. Their outstanding features were precisely those of disseminated sclerosis, viz., spastic pyramidal symptoms and signs, incoordination, intention-tremor, nystagmus, involuntary laughing, dysarthria, and a general mental imperfection. Post-mortem, an entirely different picture from that of disseminated sclerosis was found. In the basal ganglia and internal capsule, in crura cerebri, red nuclei and substantia nigra were noted collections of plaques similar to the senile variety. A long pathological description of the case is furnished, with a critical examination of theories bearing on the formation of senile plaques. In many places the amyloidosis of the case stood in relation to blood-vessels. The plaques found in the brain, however, differed in their site from the senile variety, in their intimate structure, and also in their numbers.

J. S. P.

[170] **The acute ataxia of Leyden** (De l'ataxie aiguë de Leyden à propos de deux observations nouvelles).—L. van Bogært. *Ann. de médecine*, 1931, xxix, 69.

An interesting historical introduction is followed by a scheme of classification and detailed reports of two personal cases. In the first, an underlying minimal infection was surmised but not proved; in the second, after a trifling endogenous toxicosis, the syndrome of acute ataxia developed, leaving after it a series of vasomotor derangements, central and peripheral. Review of

the recorded cases does not permit any definite conclusion as to the worth or otherwise of Leyden's own conception, viz., that of a specific encephalomyelitis. Dr. van Bogært considers that an infection or toxæmia may do no more than activate a virus already harboured without danger by the person concerned.

J. S. P.

[171] **Disorders of sensation in Charcot's disease** (Alteracoes da sensibilidade na doenca de Charcot).—Austregesilo Filho. *Thesis, Faculdade de Medicina*, Rio de Janeiro, 1930.

From time to time records of amyotrophic lateral sclerosis in which sensory changes have been found clinically appear in the literature. These are summarised by the author of this thesis, who adds five personal cases, some with pathological corroboration.

He notes that these changes may be both subjective and objective; they are usually discrete, not systematised, and involve all forms, both superficial and deep, in an irregular fashion. They can properly be correlated with pathological alterations in posterior columns and roots.

S. A. K. W.

[172] **Some further cases of binasal hemianopia** (Über einige weitere Fälle von binasaler Hemianopsie).—A. Lutz. *Archiv f. Ophthalmol.*, 1930, cxxv, 103.

The author describes the details of nine cases which he has collected. They corroborate in general fashion the conclusions which he had reached previously (see this Journal, vol. ix, p. 170). Binasal hemianopia is far more common in men than in women, and is usually seen in the prime of life. Other symptoms of any kind are often extraordinarily meagre, and there is no simple mark whereby it can be easily recognized; it has to be sought for. Its causes vary, and include ventricular tumour, syphilis of the base, and arteriosclerosis.

S. A. K. W.

PROGNOSIS AND TREATMENT.

[173] **The use of sulphur for the production of fever.**—R. P. Mackay. *Arch. of Neurol. and Psychiat.*, 1931, xxvi, 102.

The author finds that sulphur in olive oil, when injected into the muscles of the outer part of the thigh, produces a high fever, lasting from thirty-six to sixty hours, with variable elevation in the pulse rate, a vasomotor and a diaphoretic response less marked than in fever from typhoid vaccine,

a marked polymorphonuclear leucocytosis and other less important physiological changes. Local pain and tenderness at the site of injection, while present, are not particularly troublesome to the average patient with dementia paralytica. Experimental injections of suspensions of sulphur in oil and sulphur in acacia-saline solution into the rabbit's leg show a marked localized necrosis with an acute inflammatory reaction which is finally resolved.

This work tends to show that the fever and other changes following the injection of sulphur intramuscularly result from the breaking down of muscle tissues into fragments which, when absorbed, cause a so-called protein reaction. Fever produced by injections of sulphur seems capable of effecting the same therapeutic results that any other form of fever can produce. It is chiefly of value in cases of dementia paralytica in which malaria is indicated, and in many ways is superior to malaria, especially in the hands of the average physician.

R. M. S.

Psychopathology.

NEUROSES AND PSYCHONEUROSES.

[174] **The psychology of compulsory disease.**—W. STEKEL. *Jour. Nerv. Ment. Dis.*, 1931, lxxiii, 600.

THE author points out that compulsion disease is becoming much commoner and that hysteria, anxiety neurosis and neurasthenia are becoming rare. He attributes the latter group of illnesses to the repression of sex impulses in the individual and considers that this is also becoming much less common than it used to be. The compulsion disease he defines as a condition in which the patient is confronted with the formula, 'If I don't do this something awful will happen.' His analysis, of which examples are given, leads him to think that this situation is due to the fact that the present adolescent is brought up in the old-fashioned strict moral code but that nowadays the parent does not him or herself submit to this code. The compulsion neurosis arises when the youth of either sex discovers the discrepancy between the code and the conduct of their parents. The author proceeds to argue that prolonged and deep analysis is not necessary or desirable but that once the faulty attitude of the patient is unmasked and he understands the symbolic nature of the symptom he should be taught or persuaded to give it up.

R. G. G.

[175] **Wernicke's cramp neurosis** (Über die Krampusneurose Wernicke).—J. WILDER. *Der Nervenarzt*, 1932, v, 17.

IN 1904 Wernicke described as cramp neurosis a peculiar condition of general cramps throughout the body, identical in their pain and contractions with those of a local kind. The affection is stated to be extremely rare, but the author has seen three cases within a comparatively short time. He considers that it has its basis in a combination of a minimal polyneuritis or radiculitis with defect in uric acid metabolism, and believes it originates in peripheral nerves and muscles, not centrally. Spondylarthritis deformans also seems to play a contributory role.

J. V.

PSYCHOSES.

[176] **The dementia præcox-schizophrenia problem.**—JAMES V. MAY. *Amer. Jour. Psychiat.*, 1931, xi, 401.

DEMENTIA præcox is regarded as a disorganization of the personality developing during the period of adolescence or maturity. It is characterized by incoordination of the mental mechanisms and is associated sooner or later with intellectual deterioration without any definite organic basis which can be demonstrated at this time. Psychologically, it is the reaction of an inadequate personality to the difficulties of his environment. This inadequacy is not demonstrable in the intellectual field but expresses itself in an inability to react, as the normal well-balanced personality does, to the difficulties encountered during the course of the educational, economic, sexual, emotional, domestic, or social life of the individual. The inadequate personality may evince itself in any one of these spheres. Dementia præcox is looked upon as a clinical entity—a psychosis the principal and characteristic features of which may be either: (1) a primary progressive deterioration; (2) an autistic or dereistic withdrawal from the environment; or (3) an intellectual incoordination. All of these types end eventually in a partial or complete deterioration. Schizophrenic episodes, syndromes, or reactions not belonging to the dementia præcox group conform in a general way to the clinical picture of some types of dementia præcox, but do not deteriorate and are distinctly episodic in character. They occur in the course of mental deficiency, psychopathic personality, somatic diseases, traumatic conditions, alcoholism, epilepsy, the involution period of life, and even in senility and general paralysis. The assignment of these syndromes to the dementia præcox group undoubtedly explains the recovery rate in that disease reported by various authors.

C. S. R.

[177] **The pathogenesis of anaërobic infections in the major and minor psychoses, with control cases.**—W. M. FORD-ROBERTSON. *Jour. of Ment. Sci.*, 1932, lxxviii, 12.

IF anaërobic cultural technique is omitted in the bacteriology of insanity, the greater and most important part of the flora is inevitably missed. Anaërobic Klebs-Lœffler species exist in the tonsils and intestinal tract and in association with them are numerous closely allied bacteria belonging to the anaërobic diphtheroid group. Strictly anaërobic species of leptothrix bacteria have been found, which are probably closely related and similar in toxic action to the anaërobic diphtheroids. Both groups by ordinary methods of animal experiments are non-virulent to guinea-pigs, but may prove mildly toxic, and would appear to have an affinity for the lower alimentary canal. Systematic methods have clearly demonstrated the importance of the colon as the main focus of infection by the strictly anaërobic species of bacteria, and it is possible to trace their source in the minor foci of infection. The incidence of these organisms has been carefully compared in controls, and in those suffering from definite mental disorder, psychoneurotic and prepsychotic states. The results show conclusively that their occurrence is much greater in insanity and allied states—a fact which, it is claimed, must have an etiological significance of importance. The prepsychotic cases are regarded as being more liable to severe and lasting mental breakdown than those belonging to the psychoneuroses and neurasthenias. From the study and comparison of the action of known neurotoxic bacteria and the anaërobes in question, there would seem little doubt that the latter have a similar, though necessarily modified, toxic action to the former. In this process of modification certain specific neurotoxins are formed which exercise a selective action on the central nervous system. Endotoxic action is regarded as being an important additional factor in the production of neurotoxæmia. Such action, in addition to effecting slow degenerative changes in the nerve tissues of the brain, has marked local effects, especially on Auerbach's nerve-plexus and the autonomic system. The condition of tonic hardening of the colon results in perverted action of the reflex arcs centred in the cord, and can give rise to disturbances of cerebral function. Also it is productive of the later and more extensive morbid changes in the lower alimentary canal, and responsible for establishing the conditions of severe toxæmia that lead to permanent mental disorder. Neurotoxins absorbed from the alimentary canal or elsewhere may reach the brain by two possible routes—one by the systemic circulation, the other via the nerve-trunks and spinal cord.

C. S. R.

[178] **The problem of the anatomy of schizophrenia.**—W. SPIELMEYER. *Jour. Nerv. Ment. Dis.*, 1930, lxxii, 241.

THE author points out two errors in estimating the subject under discussion: (1) the difficulty in knowing what is normal and what is abnormal; (2) the tendency to attribute the accompaniments of acute symptoms (convulsive attacks, etc.) to the pathology of the original disease. He believes, however, in an organic basis for schizophrenia although it cannot at present be exactly defined. This conclusion does not rule out the ' functional ' nature of the manifestations or even the ' functional ' origin of the condition.

R. G. G.

[179] **Chronic hallucinatory psychosis** (Contributo allo studio della psicosi allucinatoria cronica).—C. BERLUCCHI. *Riv. sper. di freniat.*, 1931, lv, 3.

THIS is a careful study of the form of mental affection described more particularly by the French school of psychiatry as chronic hallucinatory psychosis. The writer considers that the ideas of persecution with which it is often found associated originate in a disorder of personality and in particular of intelligence; the condition is sometimes seen in those who have abused alcohol, and should be classified with schizophrenia; its characteristic feature is the predominance of delirium, with which the hallucinations are combined.

J. V.

[180] **The psychological estimation of the effects of certain drugs upon the syntonic and schizophrenic psychoses.**—JOHN H. EWEN. *Jour. of Ment. Sci.*, 1931, lxxvii, 742.

THE inference drawn is that introverts and schizophrenics have a low synaptic resistance, and that extroverts and manic-depressives have a high synaptic resistance. Hence these temperamental types may be conditioned by the state of the synapses of the central nervous system. It is a likely hypothesis that the resistances of the synapses are influenced by the action of drugs. It would therefore appear a justifiable assumption that the essential basis of temperamental variety, the causal factor lying at the root of inborn idiosyncrasy, is the presence in the organism of some substance akin to the two classes of drugs investigated. This substance, probably derived from the activities of the endocrines, may influence temperament through its action upon the sympathetic or autonomic systems, as some of the results obtained from adrenalin, ephedrine and atropine would appear to indicate. The main evidence, however, points to an action upon the

synaptic junctions, an action that is brought about in all probability as a result of the influence of some product of general metabolism circulating in the body. The present trend of physiological opinion is that nerves produce their effects through the intermediary of chemical agents. The researches on acetylcholine and histamine would appear to substantiate this contention, and to show a close connexion between nerve action and chemical stimuli. That the product postulated has a chemical action akin to that of the classes of drugs examined is a hypothesis that would appear to have some foundation in experimental fact.

C. S. R.

PSYCHOPATHOLOGY.

[181] **The biological problem of hallucination** (Le problème biologique de l'hallucination).—R. Mourgue. *Ann. méd.-psychol.*, 1931, ii.

There are three orders of phenomena, bearing on hallucinosis, in the course of which the organism functions as a whole, and these may thus be summarized: (1) Certain drugs can produce visual hallucinations, and it is known that their point of attack is the organo-vegetative system. (2) In all hallucinated persons a particular state of consciousness exists, analogous to but not identical with half-sleep, which the author describes as 'depersonalization.' (3) The characteristic phenomenon of projection or exteriorization in reference to the self of the subject concerned is always in evidence.

The theory here suggested is that the sphere of orientation is always invaded, under certain circumstances, by that of the instincts. The state of depersonalization is not specific, but spatial projection is; the apparatus for projection is deranged by the invasion mentioned. At any level in the organo-vegetative system the trouble may have its starting-point.

J. S. P.

[182] **Insanity and its relation to the parturient state.**—Bethel Solomons. *Jour. of Ment. Sci.*, 1931, lxxvii, 701.

The description of the symptomatology of puerperal insanity dates only from 1875. An investigation of 54,000 cases of labour at the Rotunda Hospital revealed 81 cases of insanity, i.e., 0·17 per cent. At Grangegorman Asylum the percentage-rate for all cases of insanity was nearly 5. The ratio of cases of insanity to the number of births registered in the Irish Free State in the three years 1928, 1929, and 1930 was 162 to 175,730, i.e., 0·9 per cent. Toxæmia, sepsis and chorea are probably the chief predisposing factors in puerperal insanity.

C. S. R.

[183] **Sex-linked inheritance in mental deficiency.**—Aaron J. Rosanoff. *Amer. Jour. Psychiat.*, 1931, xi, 289.

Mental deficiency seems to be consistently more common in the male sex. This is most strikingly shown in opposite-sex twins. It appears in a similar consistent way that girls make a slightly better showing than boys in intelligence tests and in scholastic record. These facts suggest that gene factors of intelligence may in some cases be carried in the X-chromosomes and not only in the autosomes; or, in other words, that there may be a sex-linked factor in some cases in the genetic history of mental deficiency and of general intelligence. In order to make the simplest provision in biological symbols and formulas for a sex-linked factor, it is necessary to assume the existence of six possible types of males, nine types of females, and 54 types of mating. Theoretically, from 38 of these types of mating only normal offspring can result. The mentally deficient offspring that may result from eight other types of mating may be expected to be equally distributed in the two sexes, as far as the possible influence of any sex-linked factor is concerned. Only male mentally deficient offspring can result from the remaining eight types of mating. Among phenotypes it is impossible to distinguish the various genotypes represented in the symbols and formulas listed here. However, it may be readily deduced from the formulas that when both parents are mentally deficient or when the father alone is, an equal distribution of mental deficiency in the two sexes of offspring may be expected. When both parents are normal or when the mother alone is mentally deficient, then, too, mentally deficient offspring of both sexes may result; but their distribution will not be equal in the two sexes, for the cases in which a sex-linked factor may be operative will be included in this part of the material. Here, according to theory, any relative excess of mental deficiency in the male sex must be, at least in part, attributed to a sex-linked factor. A re-investigation of Goddard's published material bears out the assumption of a sex-linked factor in the genetic history of mental deficiency. The general relative excess in the male is, however, greater than can be accounted for by this factor; to some extent it must be attributed to some other factor or factors.

C. S. R.

[184] **Alleged hæmoclasia in the insane : a study of fifty cases, with special reference to technique.**—T. D. Power and A. W. Pettit. *Jour. of Ment. Sci.*, 1932, lxxviii, 147.

The authors failed throughout these investigations to find any reasonable grounds for concluding that among the insane there occurs either a digestion

leucocytosis or a digestion leucopenia. Variation in a succession of blood-counts developed in a large number of patients, whether the latter had been given milk or were fasting, and there was no definite evidence that the taking of food had any effect on the leucocytic curve. It is possible that the hourly and daily rhythm of the white corpuscles, described by Sabin and Shaw, may not be exactly the same in the mentally deranged as among normal individuals; but this must be a matter for future research, and has nothing to do with the subject of hæmoclasia.

C. S. R.

[185] **Some aspects of the leucocyte associated with mental disorder.**—G. W. T. H. Fleming. *Jour. of Ment. Sci.*, 1932, lxxviii, 129.

Both the polynuclear count and the Schilling index show the presence, in acute and chronic cases of insanity, of an infected condition in a considerable proportion. Tuberculosis, although it is responsible for a certain small number of cases, is not the chief factor at work. Obscure sources of infection such as the gall-bladder, nasal sinuses and intestine, are probably the cause of the shifts to the left and low polynuclear counts which have been observed.

C. S. R.

PROGNOSIS AND TREATMENT.

[186] **Sulfosin therapy in schizophrenia.**—Louis Minski. *Jour. of Ment. Sci.*, 1931, lxxvii, 792.

Twenty patients suffering from schizophrenia were treated with sulfosin, of whom two recovered, one became much worse, and 15 showed no change. Heredity and sex appeared to have little bearing on the result of the treatment of patients in this series. The treatment appeared to be perfectly safe and without any serious risks. During the pyrexial period unpleasant symptoms in the form of pain, sickness, loss of appetite and headache were common, but after the injections had been discontinued definite improvement in the physical state occurred. Some degree of tolerance appeared to be produced, as shown by the diminished pyrexial reactions with successive doses of sulfosin. Blood-sugar levels on the whole appeared to be raised, with a tendency to delay in the return to normal of the blood-sugar.

C. S. R.

[187] **Experimental treatments of schizophrenia.**—G. de M. Rudolph. *Jour. of Ment. Sci.*, 1931, lxxvii, 767.

Twenty-three treatments of schizophrenia are described and their relative values discussed, three series of untreated cases being used as controls. The treatments have been divided into groups, and a factor common to all producing improvements has been suggested. This factor is the ratio of the corpuscular bicarbonate to the corpuscular chloride, some treatments increasing the bicarbonate, some diminishing the chloride. The hope is expressed that this comparison of methods of treatment will stimulate those who possess the opportunity to adopt those methods which appear to be of value, so that the successful treatments may pass from the realm of hypothesis and experiment to that of theory and fact.

C. S. R.

[188] **Treatment of general paralysis.**—Leland E. Hinsie and Joseph R. Blalock. *Amer. Jour. Psychiat.*, 1931, xi, 541.

This paper comprises a report, from clinical and laboratory standpoints, of 197 patients with general paralysis treated from July, 1923, to July, 1926. It covers three separate methods of treatment, viz., (1) malaria, (2) tryparsamide, and (3) combined malaria and tryparsamide. There were 125 males and 72 females. Irrespective of the type of treatment, the remission rate was 22·3 per cent., the deaths amounted to 40·2 per cent. In 1930 18 per cent. of the original group were considerably improved and 20 per cent. were considered unimproved. Of all the patients living in 1930 57 per cent. were at home and 43 per cent. were in hospitals for the care of the mentally sick. The clinical outcome in the female group was more favourable than in the male. The highest remission rate was in those treated by tryparsamide (and mercury) alone, and the percentage of deaths in those treated by malaria alone and by tryparsamide alone was about the same. Those classified as 'expansive' experienced the highest remission rate, those with a schizophrenic colouring had the lowest. In 1930 the blood Wassermann reaction was negative in 77·7 per cent.; the spinal fluid Wassermann was negative in 83·1 per cent.; the colloidal gold curve was negative in 93·7 per cent. The greatest incidence of negativity occurred among those who received tryparsamide and in those who were classified as 'simple dementing.'

C. S. R.

[189] **Treatment of stupor.**—Karl H. Langenstrass. *Amer. Jour. Psychiat.*, 1931, xi, 447.

Twelve stuporous catatonics were treated by the Lœvenhart method (respiratory stimulation by the inhalation of carbon dioxide and oxygen). Five patients showed only a transient period of responsiveness that lasted from 20 to 30 minutes. In these cases no lasting improvement of the clinical picture was observed. One patient remained stupor-free for a period of four hours immediately following the carbon dioxide inhalation. In two of the group the treatment was followed by a period of responsiveness extending over one week. Thereafter they withdrew gradually into the stupor state. Four had the stupor-free period for many months and these have so far not shown any tendency to relapse. Furthermore, in all four the inhalation was seen to initiate a marked and gratifying improvement of their entire mental and physical condition. On the view that possibly a combination of several methods might increase the effect of the Lœvenhart treatment, for three weeks previous to the gas treatment efforts were made to establish somewhat of a rapport, therapeutic suggestions were made and a series of 10 intravenous injections of a diluted streptococcus vaccine were made at two-day intervals.

C. S. R.

[190] **Clinical findings in 'recovered' cases of schizophrenia.**—Nolan D. C. Lewis and Elsie Blanchard. *Amer. Jour. Psychiat.*, 1931, xi, 481.

In 41 per cent. of the cases there was a reliable family history of mental disorder sufficiently serious to be of some importance in evaluating hereditary factors. Only 26 per cent. had made a satisfactory economic prepsychotic adjustment and only 27 per cent. of the 88 men who had been in military service had given good and efficient service. Such mental symptoms as are usually considered to be of more malignant import, such as hypochondriasis, occurred in 52 per cent., odd bizarre mannerisms in 35 per cent., excessive autistic thinking in 43 per cent., paranoid elaborations in 47 per cent., and auditory hallucinations in as many as 69 per cent. More benign expressions such as active depression was seen in 27 per cent., grandiosity in 21 per cent. Confusion was present in 45 per cent. Ability to re-establish emotional cathexes and interests in the environment is undoubtedly impaired in practically all persons who have suffered from such severe schizophrenic reactions.

C. S. R.

Reviews and Notices of Books.

Lehrbuch der Charakterkunde. By Dr. ARTHUR KRONFELD, Professor in the University of Berlin. Berlin: Julius Springer. 1932. Pp. 451. Price RM. 24.

THIS is a very instructive and well-written book. The author deals seriatim with various theories of character-formation and character analysis at present in vogue, associated with the names of Kretschmer, Jaensch, Haeberlin, Klages, and others. What he calls the 'biologico-medical' theory may perhaps attract the reader's attention most. He disposes of the arguments sometimes advanced against inferring views of normal character-building from consideration of psychopathological types. An informative section deals with the inheritance of character and is based on many published records of a heredo-familial kind. No less interest attaches, however, to Professor Kronfeld's criticism of Freudian characterology. This part of the book is peculiarly interesting. The author points out the significance of the well-recognized fact that Freudian teaching has been lauded on the one hand, and has met with persistent opposition on the other. The reason goes beyond any merely superficial resentment at the stress laid on sexual matters. Freudian dogma exalts the unconscious or subconscious at the expense of the conscious mind, and this runs contrary to the teaching and belief of Western civilization and of Christianity. Psychoanalysis is a destruction of all ideologies; its motto is, 'Acheronta movebo.' The 'divine' in man is the conscious, mind and soul; the heart of Western culture is acceptance of man as a conscious being. On this fundamental difference between the psychoanalytic and other schools the author has a great deal to say, thoughtfully expressed and logically handled. It amounts to a revolutionary upheaval, this insistence of psychoanalysis on the unconscious; for psychoanalysis, science is a narcissistic substitution, an onanistic equivalent; art is a fictional compensation for an inner life that does not satisfy and is soaked in sexuality; religion is an infantile mass-illusion, derived from a castration Angst—and so forth.

We should like to see the work appear in an English edition, so cogent is its argumentation on these and other features of present-day psychology.

Ritual : Psychoanalytic Studies. By THEODOR REIK. With a preface by SIGM. FREUD. Translated by DOUGLAS BRYAN, M.R.C.S., L.R.C.P. London: The Hogarth Press. 1931. Pp. 365. Price 21s.

THIS book is a psychoanalytic study in social anthropology by the parallel method; that is to say, the anthropological data and the psychoanalytic data and surmises are set down side by side, and the former interpreted in the light of the latter. The practice of couvade, the puberty rites of savages and the significance of certain aspects of Jewish ritual are arranged in this way. The work is scholarly and shows the intimate acquaintance with psychoanalytic principles and the psychoanalytic way of thinking that one associates with the author's name. The result is stimulating and suggestive, and gives a singular impression of continuity of feeling between primitive men as revealed in their ceremonials and modern man as shown in his dreams and neurotic symptoms. This impression of continuity of thought is a much more convincing affair than Jung's concept of the racial unconscious, and it is so ingeniously produced that the criticism that the reasoning is circular is well countered before it can be made.

Mechanismus : Vitalismus : Mnemismus. By Dr. EUGEN BLEULER, Professor of Psychiatry in the University of Zurich. Berlin: Julius Springer. 1931. Pp. 148. Price RM. 9.90.

WITH his accustomed erudition and philosophical insight Professor Bleuler tackles in this monograph the controversial topics of mechanistic and vitalistic interpretations of life. In his opinion the mechanistic view of life is an egregious failure; chemico-physical processes can never bring life into being, and, if they could, the chances that such combinations should be able to keep life going in the absence of some purposive function are practically nil. And if the unthinkable were to happen, and life be established by the accidental concatenation of atoms, the very forces bringing them together would be calculated also to disperse them. Vitalism, in the sense that life is a function constructed ad hoc by some ' Etwas ' outside the organism, also comes under criticism; the conception is rendered unnecessary by that of mnemismus. The idea of a ' cosmic intelligence ' is purely ' in the air ' and can be dismissed as a mere speculation. Professor Bleuler adheres with reasoned enthusiasm to the conception of the mneme, and affirms his belief in the reality of engrams, carried, it is true, by chemico-physical processes; engrams are specific for each variety of organism. They are registered, as it were, in ' lifeless colloids.' To identify consciousness with the psyche is an error; the latter must be conceived of as distinct from the former, and those who cannot do this will be ' incapable of understanding ' biological psychology. It is incorrect to say that mnemismus resolves the psyche into

atoms. The psyche is a function of the brain, and in this fashion Professor Bleuler discards all dualistic theories; differences between the psychical and the physiological are not factual differences apropos the object observed, but differences in the standpoint of the observers. Organismal and psychical ' purposes ' are identical. The psyche is a specialization of directing organic functions, itself adjusted on the basis of the physical and on individual experiences. It is the one thing which can be known both subjectively and objectively.

The essay is stimulating and suggestive, but though the views of the author are expressed with conviction they are not particularly convincing.

The Problem of Genius. By W. LANGE-EICHBAUM. Translated by EDEN and CEDAR PAUL. London: Kegan Paul. 1931. Pp. 187. Price 8s. 6d.

THIS essay deals with the perennial problem of genius in a contemplative and original fashion. Without attempting a rigid definition of genius (and how can any be made in respect of a fluctuating conception?) except by one of its aspects—that of great intellectual achievement—Dr. Lange-Eichbaum considers it must be clearly distinguished from exceptional and remarkable talent; and this, in its turn, is taken to be something ' organic, biological, constitutional,' for it is ' markedly hereditary.' Talent is an inborn endowment, a ' gift.' He will not allow that the former is separated from the latter by ' productive thought,' by ' inspiration ' and ' intuition,' by something ' fundamentally creative.' His view of genius is that it is ' the consummation of sociological, religious, and psychological factors,' and that sometimes centuries must elapse ere genius can come into its own. Its necessary antecedent is fame.

Whether this way of looking at the question will make a wide appeal may be doubtful. There are no standards of genius, no distinct human types of genius, no single capacity appertaining specifically to genius. If this be admitted, then agreement on what constitutes genius and on the cognate matter of whom we are to class as geniuses will never be attained. On the problem of the relation of genius to insanity the author comes to the conclusion that ' gifted insanity ' gains the victory over ' simple healthy talent '; but he hastens to add that this may be because ' the mentally disordered person is more likely than the sane person to become famous.' Such an opinion can scarcely be said to be worth taking seriously, yet it is repeated in another form when the author affirms that the fame of the mentally deranged person leads to elevation to the rank of genius ' more often ' than the case of the mentally healthy. As is the case with other books of the kind dealing with the same problem, we are once more astonished at the absence from consideration of geniuses belonging to medicine and the physical sciences

generally. But since Madame Blavatsky, apparently, is taken to belong to the class, and Helen Keller, and a crowd of others we need not mention, perhaps the surprise has a simple explanation. The author is mistaken in his claim that the late onset of psychosis (arteriosclerotic, syphilitic, etc.) in certain persons cited in the book is an indication of pre-existing psychopathy.

Maladies du Système Nerveux. By HENRI CLAUDE, Professor in the Faculty of Medicine, Paris, etc. (Library of the Doctorate in Medicine, edited by Professors CARNOT and RATHERY.) Two volumes. Paris: J. B. Baillière and Son. 1932. Pp. 626 and 942. Price not stated.

IN two fat volumes, of small format, containing together some 1,500 closely printed pages, Professor Claude gives the reader a 'precis' of neurology. For all its condensation the work is almost encyclopædic in its range, up-to-date in knowledge, and written in readable style. The illustrations (a few of which did duty thirty years ago in another publication) are unequal, some being mediocre, others good. The descriptions are uniformly excellent, and the general arrangement of the material satisfactory. Professor Claude makes numerous textual references to authorities without specifying the source of these; this, we think, is regrettable; the names should either be omitted, or accompanied by precise allusion to the original papers. It would be a comparatively simple matter to point out defects of omission, and some, as we consider, of commission; but these in no way detract from the conspicuous ability with which the author has discharged his difficult task.

Psychologie und Ärtzliche Praxis. By HERM. F. HOFFMANN, Professor of Psychiatry and Neurology in the University of Tübingen. Berlin: Julius Springer. 1932. Pp. 67. Price RM. 2.80.

PROFESSOR HOFFMANN'S brief essays on different aspects of psychology in its relation to medical practice contain a number of familiar truths that are doubtless worth restating. Some attention is paid to the ever-present problem of 'compensation neurosis'; in cases of industrial 'accident' the person concerned always seeks a cause in some external circumstance if he develops a neurosis, and that cause is always the alleged 'accident'; his point of view, therefore, differs in essence from that of the medical man, who cannot ignore intrinsic factors. Another feature of such cases relates to the insistence of the sufferer on his 'rights.' Many devote their whole attention to this 'Rechthabenwollen,' and become neither more or less than 'querulants.' Such a person makes out before his friends and neighbours that he is ill, and may then be told after medical examination that there is nothing the matter. To 'save his face' he accordingly begins to insist on his 'rights'; it is obviously easier and more satisfactory for him to affirm that he has been unjustly treated than that he himself is in the wrong.

Les Tumeurs du Quatrième Ventricule. By Dr. JEAN LEREBOULLET. Paris: J. P. Baillière et Fils. 1932. Pp. 431.

OF many excellent contributions to neurology emanating from the service of Professor Guillain at the Salpêtrière, the latest, that of Dr. Lereboullet on tumours of the fourth ventricle, is undoubtedly one of the very best. It is a model of what such monographs should be. Based on the study of 20 personal cases, and enriched by data drawn from no fewer than 436 observations already published, it covers the field in comprehensive fashion, is completely up to date and modernist in its views, and is well illustrated. Written in clear language, with the material properly arranged and with a long bibliography, it provides the reader with a valuable account of present-day knowledge, clinical and pathological, in respect of the growths concerned. Thus, for example, its author is at pains to describe the usual tumour species found in the fourth ventricle, and at the same time to sketch the clinical symptoms of each, enabling the student to form a good idea of what a given case is likely to prove from the histopathological standpoint when its particular clinical features are examined. In this way medulloblastoma, astrocytoma, ependymoma, hæmangioma, and others are duly differentiated. But the Thesis embodies also concise descriptions of both general and special ventricular syndromes (e.g., that of the lateral recess), lays stress on the earliest symptoms of the condition, and explains why certain cranial nerve involvement is as a rule less common than might be expected—according to the author, this last feature is due to the fact that the floor of the fourth ventricle is phylogenetically older than its roof and sides, hence presumably more resistant. Cerebellar symptoms generally precede those of lower cranial nerves. The service rendered by ventriculography is recorded, with the proviso that the procedure should be followed immediately by operation. Lumbar puncture, as is known, has its risks. A number of successful operative results are quoted, and some attention paid to further treatment by radiation.

Schizophrenia. Vol. X of the Proceedings of the Association for Research in Nervous and Mental Diseases, 1929. Baltimore: Williams and Wilkins Co; London: Baillière, Tindall and Cox. 1931. Pp. 246. Price 21s.

THE latest volume in the Proceedings of the American Association for Research in Nervous and Mental Disease amplifies and supplements a previous volume in the series (1928) dealing with the same subject. It contains about a dozen papers bearing on different aspects of the question and representing a high level of original work. Together with its companion volume it offers the reader a general survey of schizophrenia and provides

him with sources of much detailed information. The pathology of schizophrenia is discussed by Professor Spielmeyer, of Munich, and its treatment by Dr. Hinsie. Favourable results from the employment of sodium amytal in catatonia are reported by Dr. Bleckwenn.

Sex Hostility in Marriage. By TH. H. VAN DE VELDE, M.D. Translated by HAMILTON MARR, M.A. London: William Heinemann (Medical Books), Ltd. 1931. Pp. 296. Price 17s. 6d.

IN a discursive and popular fashion Dr. van de Velde roams over the general subject of marital disagreement based on sexual differences. Its cause may be sought in masculine and feminine contrasts and in aversions arising therefrom; its prevention may be secured by better choice of a partner, from either side. Marriage harmony is difficult of attainment, except by accident, unless consideration is given to mental and physical types, to character, health, social circumstances, and, indeed, a host of other factors. Of the general truth of much that is herein elaborated there can be no doubt; common sense teaches its importance, but, of course, common sense all too seldom is relied on when love is swaying the persons concerned. Some of Dr. van de Velde's counsels are counsels of perfection, and some of his suggestions are devoid of practical value; they are valid only in a world ruled by logic and uninfluenced by affective impulses. Moreover, not a little of his material is without direct bearing on the problem, however interesting in itself.

Über Querulanten. By Priv.-Doz. Dr. KURT KOLLE, Kiel. Berlin: Julius Springer. 1931. Pp. 80. Price RM. 4.80.

THIS purely clinical study is based on the examination of 49 cases classed as belonging to the category of paranoia querulans, or, rather, as having pathological complaint as their outstanding feature. The patients belonged to various types of psychopathic personality, six of the total being pure fanatics, 19 hyperthymic, 13 'kontrastreich,' four depressed, and three ethically defective. Only nine out of the 49 had failed to come into conflict with the law at one or other time. Special comment is made on the fact that at least 60 per cent. of the querulants belonged to the pyknic or athletic type, asthenic and dysplastic types being in a negligible minority. In regard to heredity endogenous psychoses do not occur in greater number in members of querulant stocks than in the general community, differing essentially therein from the case of schizophrenic and paraphrenic stocks. In conclusion, the author decides that there is no such entity as a querulant psychosis, but only querulants; that is to say, the symptom is common to a number of types and does not constitute one by itself.

A Textbook of Psychiatry. By D. K. HENDERSON and R. D. GILLESPIE. Third edition. London: Humphrey Milford. 1932. Pp. 595. Price 18s.

THE third edition of this excellent textbook contains some 50 more pages than its predecessor, the result of incorporating a new chapter on the psychiatry of childhood and of additions in other ways. The best proof of the value of the work is the comparative rapidity with which new editions are being called for; its intrinsic qualities have been remarked on in previous reviews in this JOURNAL.

Brain and Personality. By P. SCHILDER. New York: Nervous and Mental Disease Publishing Co. 1931. Pp. 136. Price $3.

THE value of the essays contained in this book would in any case be difficult to assess; but the task is made much harder by the style in which it is presented. The author has attempted as he says to ' bridge the gap between the organic and the functional.' He brings forward very interesting observations; but the connexions and conclusions are not as clearly thought out as even in this difficult borderland they might be. Even some simple clinical terms like vertigo are used in a way that suggests an insufficient analysis and appreciation of their varying significance. Nevertheless the book is full of a surprising number of observations and is very suggestive; and necessarily in such a field much must be left to the future to elucidate.

Hirnpathologische Beiträge. Edited by Professor K. SCHAFFER, Budapest, and Professor D. MISKOLCZY, Szeged. 1932. Price not stated.

THIS forms the eleventh volume of reprints of studies from the Clinics and Brain Institutes connected with Hungarian universities, and contains a number of articles of much value, some of which have already been abstracted in the pages of this JOURNAL. One of the more interesting deals at length with the pathology of schizophrenia, from the pen of Dr. Bela Hachst. It is well documented and beautifully illustrated. According to the author, pathological changes affect earliest and most those regions of the cortex which appear latest in phylogeny and which, in ' progressive cerebration,' are seen to be characteristic of the human brain when contrasted with that of the higher mammals. Much attention is paid to the occurrence of ' lecithinoid ' degeneration, at one time supposed to be pathognomonic of amaurotic family idiocy, but found in four of the author's cases of schizophrenia. Another interesting article is concerned with the histopathology of tabes, which is shown not to be a systematized disease. Its prime lesion is stated to consist in deposition of syphilitic granulation-tissues round radicular nerves, to which all other pathological change is secondary. The views of Richter and Nageotte are to some extent supported by the writer.

Les Malades dites Imaginaires. By M. NATHAN. Paris: G. Doin et Cie. 1932. Pp. 134. Price 14 frs.

DR. NATHAN'S unpretentious little book embodies many useful ideas relating to both diagnosis and treatment, and can be read with profit even by the expert. He has much to say regarding neurasthenia and the futility of an anodyne and some humdrum words of consolation. Recent work has emphasized the connexion between neurasthenic states and alkalosis of blood and urine—a line of research promising well for the future. Among ' malades imaginaires ' who have been rehabilitated of late fall to be included those suffering in point of fact from alkalosis (as mentioned), from bladder atony, sympathetic disorders, endocrinic derangements of a ' fruste ' character, and cœnæsthesiopaths. On the psychopathological side consideration is given to obsessions, phobias, hysteria, and, in particular, hypochondria.

The Mind in Conflict. By RICHARD AMARAL HOWDEN. With an introduction by WILLIAM BROWN, M.D. London: Humphrey Milford, Oxford University Press. 1931. Pp. 83. Price 2s. 6d. net.

THE writer of this brochure endeavours within a small compass to give ' a simple explanation of how modern psychology sets out to solve nervous difficulties and problems.' Here, modern psychology is practically synonymous with psychoanalytic doctrines, and Freudian theories are more or less strictly adhered to. It is not an easy matter to write on a technical subject for those who are uninitiated, and we cannot help feeling that though such a reader would derive some useful insight into the working of the mind from this little book, he would also often be confused. We fail to see that any special virtue exists in the fact that this is written ' by a layman for laymen.' It is claimed that thereby there will be an adequate realization of what should be known, and that definitions will be simple and accurate. This is not always substantiated in these pages. To define the mind as ' the thing with which we think ' is regarded as quite sufficiently good for the purpose. After the importance of grasping what hysteria really means has been stressed, we are told that ' the hysterical person is one who is capable of exhibiting loss of memory, or a paralysis for which there is no cause from injury in the body, or bodily pains which are not due to definite organic illness.' Books on this topic which are models of lucidity exist already, addressed to laymen and written by recognized authorities. Nevertheless, this small volume may prove of use to those whose conception of nervous difficulties and problems needs much education.

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La Folie au XXe Siècle. By Dr. A. Rodiet, Physician to Asylums of the Seine, and Dr. G. Heuyer, Physician to the Hospitals of Paris. Paris: Masson et Cie. 1932. Pp. 359. Price 40 frs.

The authors have been at pains to examine the question of whether insanity has been on the increase since the end of the War (so far as concerns Paris and its environs) and whether, if so, it can be ascribed to factors in activity during the War years. Their statistics are based on official figures and do, in fact, demonstrate diminution during the period of hostilities and increase thereafter on rather a crescendo scale. No new types of mental disease arose out of the War, and no proof of accentuation by the experiences of warfare is forthcoming. The increase thereafter is attributable rather to relaxation of social habits, notably to intemperance, though other and somewhat special factors have also played a rôle. Possibly the most interesting part of the book is its introduction, portraying in graphic fashion the change that has come over Paris as regards modes of dress, means of transport, buildings, disappearance of humble ' types ' earning a precarious living in ways now impossible, and so on. This is admirably done, with sympathy and with insight.

L'Intuition Délirante. By R. Targowla, Physician of the Asylums, and J. Dublineau, Interne of the Asylums of the Seine. Paris: Norbert Maloine. 1932. Pp. 316. Price 35 frs.

By definition, intuition is an immediate judgment, expressed before all proof and with a high degree of assuredness. In psychopathology the evolution of the idea of intuition as a possible insane symptom has been of slow growth, though foreshadowed in older literature; of late it has engaged attention in connexion with cases of ' thought-reading ' as a symptom, notably in erotomaniacs. In greater detail, this abnormal intuition is distinguished by its personal origin, recognized by its subject—' he knows '—by its sudden and spontaneous presentation to the mind, its irresistibility, by absence of any psychosensory or intellectual antecedent, by its independence of any proofs. It is a form of morbid mental automatism, occurring episodically in a number of different psychopathic states, of which numerous clinical illustrations are here provided.

Hydrocéphalie Ventriculaire. By P. R. Bize, Chef de Clinique at the Faculty of Medicine, Paris. With 25 plates. Paris: Norbert Maloine. 1932. Pp. 662. Price 60 frs.

Dr. Bize has written a monograph on the problem of hydrocephalus in all its aspects, and has covered an extensive field in his personal researches, no fewer than 85 specimens of the condition having been submitted to

pathological examination. He has also instituted a series of experiments bearing on the pathogenesis of hydrocephalus and is evidently familiar with the wide literature on the subject that has appeared of late. Hydrocephalus is in essence a derivative of derangement in respect of cerebrospinal fluid production and flow, and the first section of the work is devoted to fluid questions. Radiography and ventriculography are utilized in the prosecution of his study. His views on fluid secretion, circulation, and absorption are of interest. There is a long bibliography, which adds to the value of the work.

The Hygiene of Marriage. By ISABEL EMSLIE HUTTON. London: William Heinemann (Medical Books) Ltd. 1932. Pp. 140. Price 5s. net.

AN excellent little volume which deals simply and clearly with every phase of marriage hygiene. It amply fulfils the purpose for which it was written; but we cannot help wondering why the author thinks 'it is perhaps regrettable that it has been necessary to deal with the subject of contraceptives.' Those who need knowledge in this realm can read these pages with interest and profit. One scientific inaccuracy should be pointed out. On p. 21 it is stated that alcohol stimulates sex feeling; but a better explanation is that alcohol narcotizes the higher nervous centres, lessens inhibitions, and may thus release sex desire and bring about overt action. That there is a demand for such a book is proved by the fact that two previous editions have been published.

The Lizard's Brain. By A. FREDERIKSE, Baarn, Holland. Nijkerk (Holland): C. C. Callenbach. 1932. Pp. 95. Price not stated.

NO atlas of microscopic sections of the brain of a reptile has hitherto appeared, comparable to those surveying the brain of cat, rabbit, and monkey. This beautifully printed and illustrated monograph supplies the want, and will be found of immediate service to those whom the subject interests.

Les Agents Physiques dans le Traitement des Maladies Nerveuses. By HENRI SCHAEFFER, Physician to the St. Joseph Hospital, and ELIO BIANCINI, Editor of the Revue d'Actinologie. Paris: Masson et Cie. 1932. Pp. 190. Price 20 frs.

A USEFUL and practical vademecum on physiotherapy deals with all the present-day methods of nervous treatment. Proper attention is devoted to the technique of X-ray and radium procedures for cerebral tumours, of

ultra-violet rays for neuralgia, and so forth. The chief disease-conditions amenable to physiotherapy are classified topically and dealt with seriatim. This little book contains much of interest for any practising neurologist and can be cordially commended to his attention.

Anatomie Élémentaire des Centres Nerveux et du Sympathique. By P. GILIS, Professor of Anatomy in the Faculty of Medicine of Montpellier. Second edition, revised by J. EUZIÈRE, Professor of Nervous and Mental Diseases in the Faculty of Medicine of Montpellier. Paris: Masson et Cie. 1932. Pp. 234. Price 24 frs.

THIS little volume, nicely illustrated by simple and clear anatomical diagrams, contains a precis of nervous anatomy inclusive of both the neuraxis and the sympathetic system. But there is more for the student than merely the bones of his subject, since both the physiology and the pathology of the various anatomical systems, tracts, and centres are sketched briefly yet with considerable accuracy. As an introduction to more elaborate treatises it is certainly likely to prove both useful and stimulating.

Individual Sexual Problems. By F. G. CROOKSHANK, M.D., F.R.C.P. Psyche Miniatures Medical Series No. 14. London: Kegan Paul, Trench, Trubner & Co., Ltd. 1931. Pp. 150. Price 2s. 6d. net.

THREE lectures delivered by Dr. Crookshank are here embodied in book form. The author is an ardent follower of Adler; and the varied factors involved in sexual problems are here dealt with from the point of view of individual psychology and the differences between the Adlerian and Freudian outlook are pointed out. Instead of the psychoanalytic pan-sexualism, individual psychology regards sexual difficulties as just one of the three great problems to be tackled in life, viz., subsistence, society, and sex. Sexual maladjustment is no clinical entity, but a symptom of an individual's outlook upon and whole attitude to life. The subject is sketched out in a persuasive and attractive form, and the little volume is full of interest.

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